# DEVELOPMENT AND PRELIMINARY VALIDATION OF MEASURES TO ASSESS MOTHERS' SELF-REGULATORY EFFICACY AND OUTCOME EXPECTATIONS TO TRANSPORT PRESCHOOL AGED CHILDREN TO STRUCTURED PHYSICAL ACTIVITIES

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By

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ABSTRACT

Structured physical activity (SPA) is one type of physical activity in which preschool aged children participate (e.g., soccer programs). Given that SPA often occurs at community-based locations, such as at a field or hockey rink, primary caregivers, who are often times mothers, must transport their preschool aged children to the scheduled SPA. Although studies have examined social cognitions important to individuals' participation in their own scheduled physical activity, no study to date has focused on the social cognitions of mothers' that may be related to the transportation of their preschool aged children to SPA. The purpose of this two-study dissertation was to use self-efficacy theory to develop and examine the reliability and validity evidence of measures to assess mothers' social cognitions (i.e., self-regulatory efficacy to overcome barriers and to schedule/plan; outcome expectations including likelihood and value) that may be related to transporting their children to SPA. A literature review, focus group elicitation with nine participants ($M_{age}$= 35.25 years; *SD* = 3.57), and feedback from three expert judges and 10 participants were used to develop items for each of the measures in Study 1. The reliability of the measures was then investigated in Study 1 using data from 31 participants ($M_{age}$= 33.50 years; *SD* = 5.79) to examine initial internal consistency and then 64 participants ($M_{age}$= 32.87 years; *SD* = 4.48) to further examine internal consistency and temporal stability. Findings revealed some evidence for the content and construct validity, internal consistency, and temporal stability of the measures. To continue the construct validation of the measures, it was important to continue to examine the reliability evidence of the measures and other aspects of validity, including concurrent and predictive validity. In Study 2, data from 93 participants ($M_{age}$= 34.88 years; *SD* = 5.04) were used to examine evidence of the criterion-related validity (i.e., concurrent and predictive) of the developed measures. Results revealed convergence of the

measures that assessed similar constructs (i.e., self-regulatory efficacy to schedule/plan and to overcome barriers; outcome expectations: likelihood and value). However, evidence of the divergence of the self-regulatory efficacy measures from the outcome expectation measures was less consistent. Results also revealed that the self-regulatory efficacy beliefs and outcome expectations measures were not significant, independent predictors of transportation to SPA. These predictive validity findings as well as the divergence findings may have been due to the type of mothers who participated in the study (i.e., highly experienced in transporting children to SPA). Findings from the present series of studies suggest a need for continued exploration of the measures, including research with a more diverse sample. Collecting further reliability and validity evidence of these measures to compare it with the evidence from the present studies would contribute to the ongoing construct validation of these measures.

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# CHAPTER 1
# GENERAL INTRODUCTION

Concern about the increasing rate of childhood obesity (Lobstein, Baur, & Uauy, 2004), as well as the age-related declines in physical activity participation that begin as early as 3 years of age (Torun et al., 1996) have resulted in calls to increase our understanding of factors related to children's physical activity participation (Cameron, Craig, & Paolin, 2005). In 2010, the sixth annual report card on physical activity for children and youth released by Active Healthy Kids Canada (*Healthy Habits Start Earlier Than You Think*) called for a targeted effort to identify factors that impact young children's participation in different types of physical activity (i.e., preschool aged children of 5 years and younger). The report called for a focus on factors associated with the two main types of physical activity in which preschool aged children participate: unstructured and structured. Unstructured activity includes free, unorganized play and walking (e.g., walking to a neighborhood park) (Active Healthy Kids Canada, 2010). In contrast, structured physical activity (SPA) is planned and directed by adults, requiring the registration of children in order to participate (National Association for Sport and Physical Education [NASPE], 2002; Spink et al., 2006). Examples of SPA include tumbling or dance classes, swim lessons, and community-based team sports, such as soccer or baseball.

As captured in the definition, SPA requires that children are registered in the activity, which often occurs at community-based locations, such as at a field or hockey rink. Parents, being the primary caregivers for their children, play a pivotal role in facilitating their children's participation in SPA. In particular, parents must engage in their own volitional, motivated behaviors, namely, registering their children in SPA and then providing transportation to the scheduled SPA in order for their children to participate regularly (Baranowski & Jago, 2005; Brustad, 1993; Timmons, Naylor, & Pfeiffer, 2007).

These volitional, motivated behaviors require forethought and rational planning on the part of the parent(s) (Bandura, 1986). For example, the behavior of registering children for SPA requires parents to choose which SPA they will register their children in and then complete and submit a registration form before the deadline. This specific registration behavior occurs only once – before the program begins. In contrast, providing transportation to SPA is a complex act, occurring multiple times during the period of time in which the SPA program sessions are scheduled (e.g., every weekly session during a two-month gymnastics program). Although the behavior of transporting a child to a location may seem as easy as getting in the car and driving, an activity most people do on a daily basis, it is not as easy as it first may seem. Transporting one's child to structured physical activity on a regular basis involves effort, persistence, and the enlistment of a number of complex self-regulatory skills in order to complete the task of transportation to SPA. For example, one may have to self-monitor one's own behavior to determine if one has the time and energy to carry out the task. One may also have to set goals in order to be ready to engage in the task of transportation by a certain time in the day to ensure an on-time arrival of the child to SPA. One may also have to make decisions about whether to engage in other competing activities, and perhaps structure one's environment to make it conducive to completing the behavior of transportation to SPA.

Furthermore, during the course of a SPA program, various challenges to parents' participation in and adherence to transporting their children may arise, such as a faulty automobile, a sick family member, or a busy family or personal schedule. When challenges arise, various social cognitions may impact parents' decisions to transport their children to SPA (Bandura, 1986). When considering all of these skills, what becomes evident is that transporting

one's child to SPA on a regular basis appears to be a complex, motivated behavior that requires effort and persistence over time to perform regularly.

Although parents' decisions about registering their children in activities are often made together (Donnelly & Kidd, 2003), fathers and mothers behave differently to actually facilitate their children's physical activity participation (Lareau, 2000; Thompson, 1999). Thompson (1999) found that the tasks related to children's sport participation (e.g., transportation to facilities, washing clothes needed for the sport, and completing the registration forms) were overwhelmingly performed by mothers. Because mothers are often the primary caregivers for preschool aged children, responsible for transportation of their children to activities (Cameron et al., 2005; Grolnick & Slowiaczek, 1994; Lareau, 2000; Thompson, 1999), mothers were examined in the present program of research, with a focus on select social cognitions that were specific to transportation to SPA.

Although numerous studies have examined social cognitions important to individuals' participation in their own motivated health behaviors, such as their own physical activity (e.g., McAuley & Blissmer, 2000; Sallis & Owen, 1999), no study to date has focused on the social cognitions of mothers' that may be related to transportation of their preschool aged children to SPA. To begin to explore which social cognitive factors may contribute to mothers' transportation of their children to SPA, the use of a theoretical approach is recommended (Baranowski, Anderson, & Carmack, 1998; Brawley, 1993). A theoretical approach provides a framework for examining hypothesized relationships between variables and conceptual and operational definitions for the measurement of variables. A theoretical approach can also be used to focus research on *alterable* social cognitive processes that may impact adherence to motivated

behaviors (Brawley, 1993). This is necessary if the eventual goal is to improve behavioral performance.

Mothers must self-regulate their thoughts and actions in order to successfully transport their children to SPA (cf. Bandura, 2007; Baumeister & Vohs, 2003; Grusec, Goodnow, & Kuczynski, 2000). Therefore, self-efficacy theory (Bandura, 1997) was an ideal theory to apply to the study of mothers' transportation to SPA behaviors. The following section provides an overview of this theory.

**Self-efficacy theory**

As part of the broader social cognitive theory (Bandura, 1986), self-efficacy theory proposes that individuals are capable of creating and modifying the processes that shape their own and others' lives. Self-efficacy theory assumes that: (a) behavior is goal directed, (b) individuals are active in determining their behavior, and (c) individuals are capable of forethought, planning, and rational decision making (Bandura, 1997). Further, self-efficacy theory postulates that effort and persistence in performing motivated behaviors may be impacted by self-efficacy beliefs and outcome expectations (Bandura, 1997; see Figure 1.1). These social cognitions are subsequently reviewed.

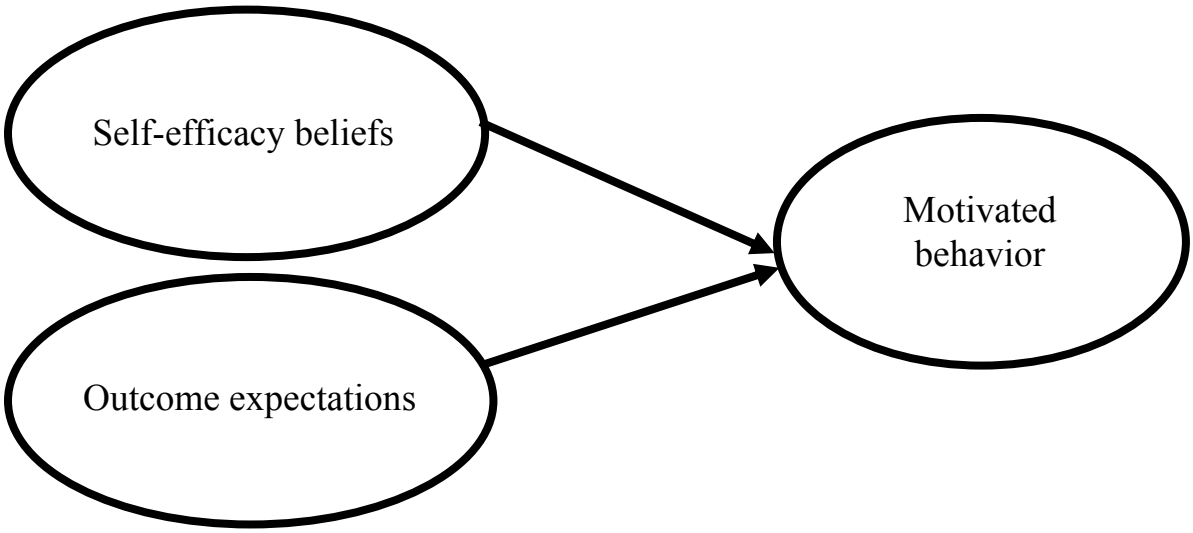


Figure 1.1. Performing a motivated behavior, such as transportation of children to SPA, may be impacted by self-efficacy beliefs and outcome expectations.

**Self-efficacy.** Self-efficacy is defined as beliefs in one's skills and abilities to exercise control over one's actions (Bandura, 1997). Although self-efficacy theory has been investigated in the broader physical activity domain when individuals' own participation was the outcome (e.g., Dishman, Saunders, Motl, Dowda, & Pate, 2009; Gyurcsik et al., 2009), no research to date has examined the role that self-efficacy beliefs play in mothers' transportation to SPA behaviors. In relation to this behavior, two self-regulatory performance domains were of particular interest in the present program of research – the scheduling/planning of transportation and the overcoming of barriers to that transportation.

These two performance domains may be important because, when making decisions for themselves and their children, mothers often struggle with a variety of competing activities (Active Healthy Kids Canada, 2010). The ability to schedule/plan around the demands of other activities and overcoming unexpected barriers may be two important components of mothers' abilities to self-regulate their transportation to SPA (cf. Bandura, 2004). Self-regulatory efficacy to schedule/plan captures individuals' beliefs in their skills and abilities to regularly schedule and plan to perform the motivated behavior (Bandura, 1986, 1997; McAuley & Mihalko, 1998; Shields, Brawley, & Lindover, 2006; Woodgate, Brawley, & Weston, 2005). Self-regulatory efficacy to overcome barriers concerns individuals' beliefs in their skills and abilities to cope with barriers to motivated behavior (DuCharme & Brawley, 1995; Gyurcsik et al., 2009; McAuley & Mihalko, 1998). Overall, self-regulatory efficacy beliefs are crucial to behavioral performances and involve the individuals' beliefs in their abilities to self-regulate and exercise control over themselves in order to regularly achieve desired outcomes (Bandura, 1986, 1997, 2004; Maddux & Gosselin, 2003). Self-regulatory efficacy beliefs in these two domains of

performances (i.e., scheduling/planning; overcoming barriers) were targeted for measurement development and examined in this program of research.

In regards to research evidence, higher levels of self-regulatory efficacy to schedule/plan and to overcome barriers have been associated with greater physical activity participation across different adult populations (Cramp & Bray, 2009; Gyurcsik et al., 2009; Nickel & Spink, 2010; Rejeski et al., 2003; Shields et al., 2006; Woodgate et al., 2005). To date, however, no research has examined self-regulatory efficacy beliefs to schedule/plan and to overcome barriers in the transportation of preschool aged children to SPA. The present series of studies addressed this gap in the research. In the next section, outcome expectations are reviewed, followed by a section on the importance of developing reliable and valid measures of self-regulatory efficacy beliefs and outcome expectations.

**Outcome expectations.** Outcome expectations are defined as one's perception of the likely consequences that a behavior will produce (Bandura, 1997). The three major forms that outcome expectations can take are: physical, social, and self-evaluative (Bandura, 1986, 1997). Additionally, within each form are positive and negative expectations. Positive expectations motivate behavioral performance, while negative expectations hinder behavior (Bandura, 1997). Physical outcomes include pleasant sensory and physical experiences, on the positive side, and aversive sensory experiences, such as pain, on the negative side. Social outcomes include expressions of interest, approval, and social recognition from others, on the positive side, and disinterest, disapproval, and social rejections, on the negative side. The third major form of outcomes includes self-evaluative outcomes, such as self-satisfaction and affirmative self-evaluation, on the positive side, and self-dissatisfaction and self-devaluation, on the negative side (Bandura, 1997). Although all three forms of outcomes can impact whether a behavior is

performed, outcomes that are expected to occur in the near future, termed proximal outcomes, are more motivating than outcomes that are expected to occur in the longer-term, called distal outcome (Bandura, 1997).

The value that individuals place on outcomes can also affect the motivating potential of outcome expectations (Bandura, 1997). Two people may believe it is highly likely that a given behavioral performance will result in a certain outcome, but they might value that outcome differently. Thus, proximal outcomes that are highly valued and believed to be likely to occur, are the most motivating (Bandura, 1997).

Research has investigated associations between outcome expectations and participation in an individuals' physical activity (Williams, Anderson, & Winett, 2005). Some findings suggest that individuals who engage in more physical activity have significantly higher outcome expectations for being active compared to those who engage in less activity (Rodgers & Gauvin, 1998; Wojcicki, White, & McAuley, 2009). Despite the promising evidence that outcome expectations are related to individuals' own participation in physical activity, no research has examined mothers' outcome expectations for transporting their preschool aged children to SPA. As such, a need exists to develop reliable and valid measures of outcome expectations.

**Validity and reliability.** Since self-regulatory efficacy beliefs and outcome expectations are important in motivating behavior (Bandura, 1997) and have not been examined in the research on mothers' transporting their children to SPA, measures must be systematically developed and the initial evidence of validity and reliability examined. Of importance is whether the newly developed measures assess the constructs they are supposed to measure (i.e., evidence of validity) and whether the measures assess constructs consistently (i.e., evidence of reliability; Carron, Brawley, & Widmeyer, 2002; DeVellis, 2003; Kerlinger & Lee, 1973). Measures with

strong validity and reliability evidence reduce the potential for measurement error, thereby strengthening study conclusions (Hinkin, 1995). Further, measures with strong validity and reliability evidence can be used to examine theoretical relationships that explain why a certain behavior, such as transportation to SPA, occurs or does not occur. Since mothers' self-regulatory efficacy and outcome expectations are not directly observable, it is important to develop appropriate measures to accurately assess these social cognitive constructs (Carron et al., 2002). As a first step in addressing this gap in the literature, the systematic development and examination of measures to assess these self-efficacy theory-based constructs was addressed in the present research.

**Overall Purpose of the Dissertation**

Given the primary role that mothers have in facilitating their children's SPA through transportation (Lareau, 2000; Thompson, 1999) and the paucity of research on theory-based factors that influence their behavior, the purpose of this two-study dissertation was to use self-efficacy theory (Bandura, 1997) to develop and examine the reliability and validity evidence of measures to assess mothers' social cognitions (i.e., self-regulatory efficacy to overcome barriers and to schedule/plan; outcome expectations) that may be related to transporting their children to SPA. In line with Messick's (2000) unitary concept of validity, all sources of validity and reliability evidence are thought of as evidence of construct validity.

A number of methods were used in the two studies to collect different sources of initial evidence to begin to examine the overall construct validation of the measures (DeVellis, 2003; Messick, 1989, 2000). Study 1 was conducted to develop and examine the initial content and construct validity evidence, as well as to examine the internal consistency and temporal stability of the measures that assessed mothers' self-regulatory efficacy to schedule/plan, self-regulatory efficacy to overcome barriers, and outcome expectations (likelihood and value) to transport their

preschool aged children to SPA. The second study was conducted to examine the criterion-related validity (i.e., concurrent and predictive) evidence of these same measures.

**Dissertation Format**

This dissertation contains two studies that are presented in the next two chapters. Each chapter includes an introduction, methods, results, and discussion section. Following the two studies is a general discussion that summarizes the overall contribution of the research to theory and to the existing literature, as well as the strengths and limitations of the studies, ending with a discussion of future research directions.

CHAPTER 2
# STUDY 1

Many preschool aged children, ages 2-5 years, may not be participating in physical activity to achieve health benefits, such as motor skill development and the prevention of chronic diseases like obesity and cardiovascular disease (Andersen et al., 2006; Bar-Or, 1999; Flynn et al., 2006; Grunbaum et al., 2004; Pate, Pfeiffer, Trost, Ziegler, & Dowda, 2004; Timmons et al., 2007). Although government agencies and associations (e.g., Health Canada and the Canadian Society for Exercise Physiology 2002a, 2002b) have developed physical activity guidelines for school-aged children and adolescents (6 to 18 years of age), only the United States-based National Association for Sport and Physical Education (NASPE) has purposed guidelines, which were based on published research and expert consultation, for children up to 5 years.

The guidelines are that preschool children should participate in at least 60 minutes to several hours of unstructured physical activity (e.g., play, walking) and at least 60 minutes of structured physical activity (SPA) each day (NASPE, 2002). SPA, which comprises the majority of children's physical activities (Dovey, Reeder, & Chalmers, 1998), is planned and directed by adults, requiring the registration of children in order to participate (NASPE, 2002; Spink et al., 2006). Examples of SPA include tumbling or dance classes, swim lessons, and community-based team sports, such as hockey, soccer, or baseball. However, despite the current guidelines, rates of childhood obesity indicate that children as young as 3 years of age may be living in environments that allow and encourage a sedentary lifestyle (Lobstein et al., 2004). Therefore, to begin to address the issue of a sedentary lifestyle as a potential cause of childhood obesity, understanding factors related to children's participation in different types of physical activity, such as SPA, is necessary.

**Facilitating SPA in Preschool Aged Children**

Canada's Report Card on Physical Activity for Children and Youth (2007, 2010) addressed the roles of parents in facilitating their children's physical activity participation, including SPA. Children's participation increased, in part, when parents provided transportation to and from facilities where SPA occurred. However, as the most recent Report Card (2010) suggested, parents need help understanding their role as regulators of their children's physical activity. Considering the paucity of SPA-related research, the present study focused on parents' self-regulatory abilities to facilitate their children's physical activity by transporting them to SPA as well as outcomes expected from this type of motivated behavior.

**Self-Efficacy Theory and Transportation to SPA by Mothers**

Although exceptions exist, mothers take on the primary caregiving role for children, particularly young children (Grolnick & Slowiaczek, 1994; Jacobs & Eccles, 1992; Lareau, 2000; McMinn et al., 2009). In regards to SPA, the caregiving role can include transporting one's child to and from facilities where SPA occurs (Cameron et al., 2005; Laprinzi & Trost, 2009; McMinn et al., 2009; Timmons et al., 2007). As part of this 'mother as taxi' role (Thompson, 1999), mothers must self-regulate their thoughts and actions in order to successfully transport their children (Bandura, 2007; Baumeister & Vohs, 2003; Grusec et al., 2000). For example, mothers face a variety of competing forces, which require them to self-regulate the planning and organizing of their family schedules as well as to overcome and persist in the face of barriers, in order to transport their children to SPA (Grolnick & Slowiaczek, 1994; Maddux & Gosselin, 2003). Self-efficacy theory (Bandura, 1997) provides a useful theoretical foundation to study transportation to SPA by mothers. In particular, according to self-efficacy theory, individuals' efforts and persistence in performing a motivated behavior, such as transporting children to SPA, may be impacted by two self-regulatory social cognitions: their efficacy beliefs

and outcome expectations (Bandura, 1997). These social cognitions are reviewed in the following sections.

**Self-regulatory efficacy.** In general, efficacy beliefs capture individuals' confidence to perform an actual behavioral task (e.g., the task of driving) as well as their confidence to self-regulate the thoughts and actions needed to achieve a desired outcome, such as an on-time arrival to a scheduled SPA event (Bandura, 1986, 1997; Baumeister & Vohs, 2003; Brawley, Rejeski, & King, 2003; Maddux & Gosselin, 2003; McAuley & Mihalko, 1998). The extent to which individuals believe in their abilities to self-regulate and exercise control over themselves in order to regularly achieve desired outcomes are called self-regulatory efficacy beliefs (Bandura, 1986; 1997; Gyurcsik et al., 2009; Maddux & Gosselin, 2003). Self-regulatory efficacy beliefs are key beliefs for the regular performance of complex, motivated behaviors, like transportation to SPA (Bandura, 2004).

When considering the action of transporting children to SPA, mothers may need to self-regulate across a number of domains, such as the scheduling/planning of their activities and the overcoming of barriers that might prevent transportation (cf. DuCharme & Brawley, 1995; McAuley & Mihalko, 1998). Self-regulatory efficacy to schedule/plan was conceptualized in the present study as mothers' confidence in their abilities to schedule and plan courses of action needed to transport their preschool aged children to scheduled SPA (cf. Ducharme & Brawley, 1995; McAuley & Mihalko, 1998). Self-regulatory efficacy to overcome barriers was conceptualized as mothers' confidence in their abilities to overcome factors that make it difficult to transport their preschool aged children to scheduled SPA (cf. Ducharme & Brawley, 1995; McAuley & Mihalko, 1998).

Research has illustrated that self-regulatory efficacy beliefs related to scheduling/planning and overcoming barriers are consistent predictors of individuals' own engagement in physical activity (e.g., Bloomquist et al., 2008; Poag-Ducharme & Brawley, 1993; Gyurcsik & Brawley, 2001; Gyurcsik, Brawley, & Langhout, 2002; Woodgate et al., 2005). Further, a recent study provided initial evidence that mothers of preschool aged children are faced with barriers to improving their children's activity levels (McMinn et al., 2009). McMinn and colleagues had parents report the frequency with which barriers and scheduling conflicts occurred on 5-point scales (1 = *never* to 5 = *very often)*. However, obtaining only frequency information does not provide information on the extent to which parent's self-regulation is challenged (Brawley et al., 1998). For example, a barrier may occur *often*, but according to self-efficacy theory (Bandura, 1997), individuals with high efficacy beliefs will persist in overcoming that barrier. As such, obtaining measures of self-regulatory efficacy beliefs to schedule/plan and to overcome barriers may be a better indicant of challenges to self-regulatory performance than obtaining frequency measures. No research to date has measured these beliefs and examined their relationships with mothers' transportation behaviors.

**Outcome expectations.** Outcome expectations are individuals' beliefs about the anticipated physical, social, and self-evaluative consequences, both positive and negative, of a behavioral performance (Bandura, 1997). Positive outcomes serve as incentives to performing a motivated behavior, whereas negative outcomes serve as disincentives. Outcomes can also be proximal (i.e., occurring in the near future) or distal (occurring in the long-term), with proximal outcomes having the stronger impact on motivated behavior (Bandura, 2004; Rodgers & Brawley, 1991). The relationship between proximal outcomes and behavior should be strongest when individuals believe outcomes are both likely to occur and are highly valued (Bandura,

1986). Furthermore, research in the larger physical activity domain has illustrated a more consistent relationship between positive outcomes and behavior, than negative outcomes and behavior (Rodgers & Brawley, 1991; Williams et al., 2005).

Outcome expectations that mothers may have for transporting their children to SPA have not been examined to date. However, outcomes serving as motivational mechanisms for mothers to transport their children to SPA may include outcomes that the mothers expect for themselves or outcomes that the mothers expect for their children. For example, mothers may be motivated by the belief that transporting their children to SPA leads to their children's positive social development; while at the same time they may be motivated by the belief that by transporting their children to SPA they receive a break from their caregiving responsibilities. Given the focus on child development in the bulk of parenting resources (Grusec & Davidov, 2007), it may be that, in most cases, mothers would report outcomes they expect for their children to serve as the overriding outcome incentive for transporting their children to SPA. Due to the paucity of research in regard to the types of outcomes (i.e., mother or child-related) that may serve as motivational mechanisms, the present study allowed mothers to serve as active agents (Sherif & Sherif, 1969) in the identification of important proximal outcomes – whether that be for themselves, for their children, or some combination.

**Measures of Self-regulatory Efficacy and Outcome Expectations**

Measures of self-regulatory efficacy and outcome expectations have been developed and used in the larger physical activity domain to predict individuals' physical activity (e.g., see McAuley & Mihalko, 1998; Williams et al., 2005 for reviews). However, a review of the research on SPA revealed that measures to assess mothers' self-regulatory efficacy beliefs to schedule/plan and to overcome barriers as well as their positive, proximal outcome expectations (hereafter called outcome expectations) related to transporting their children to SPA do not exist.

The present study addressed this gap by developing and examining the initial reliability and validity evidence for measures of self-regulatory efficacy to schedule/plan and to overcome barriers, as well as measures of outcome likelihood and outcome value.

All four of these self-efficacy theory-based constructs are not directly observable and thus, of initial importance, is having a theory-based understanding of their basic nature (Carron et al., 2002; Messick, 2000). A theory-driven approach provides the underlying conceptual base of the constructs and the subsequent development of measures and their items. At that point, of importance is whether the measures assess the constructs they are supposed to measure (i.e., evidence of validity based on the inferences that one makes) and whether the measures assess the constructs consistently (i.e., evidence of reliability; Carron et al., 2002; DeVellis, 2003; Kerlinger & Lee, 1973). Measures with strong validity and reliability evidence reduce the potential for measurement error, thereby strengthening study conclusions (Hinkin, 1995). Further, measures with strong validity and reliability evidence can be used to examine theoretical relationships that explain why a certain outcome, such as transportation to SPA, occurs or does not occur. Finally, examining the evidence for the validity and reliability of measures also provides opportunities for other investigators to accept or reject using the measures in their own research (Cronbach & Meehl, 1955).

The collection and integration of multiple, complementary forms of validation evidence requires ongoing investigations (Cronbach & Meehl, 1955; Messick, 2000). The current study aimed to collect preliminary evidence for the validity and reliability of measures to assess mothers' self-regulatory efficacy beliefs and outcome expectations to transport their children to SPA. The validity and reliability evidence from the current study served as the starting point for the ongoing process of construct validation (Cronbach & Meehl, 1955).

**Validity.** Three main sources of validity evidence are content, criterion-related, and construct (DeVellis, 2003). Only evidence of content and construct validity were examined in the current study. Content validity is the degree to which the items in a measure are relevant to and representative of the targeted construct (Carron et al., 2002; DeVellis, 2003; Kerlinger & Lee, 1973). Content validity is established deductively by defining the construct domain and showing that the items used to represent the construct are a sample of the entire domain of that construct and not some other construct (Cronbach & Meehl, 1955). Part of the process of obtaining evidence of content validity involves developing a large pool of items and using experts to assess the degree to which each item represents the construct (Kerlinger & Lee, 1973).

Construct validity represents the match between the theoretical constructs and the real-world situations they are intended to model (DeVellis, 2003). Construct validity is not established by investigative procedures alone, but also by the reporting of the measures' links to theory (Cronbach & Meehl, 1955; Messick, 2000). Theory takes a central position in the process of construct validation by informing: (1) the choice of constructs, (2) the hypotheses involving the constructs, and (3) the testing of hypotheses (Kerlinger & Lee, 1973). Establishing construct validity is an ongoing process that requires the collection and integration of multiple complementary forms of validation evidence (Messick, 2000). In essence, construct validity seeks to establish the meaning of the measures, to justify the use of the scores from the measures, and to confirm the theory behind the measures (Clark & Watson, 1995; Messick, 2000; Kerlinger & Lee, 1973).

**Reliability.** Good measures are also reliable. Two forms of reliability are internal consistency and temporal stability. Internal consistency is concerned with the uniformity of the items within a scale (Messick, 1989). An internally consistent measure demonstrates that a single

construct is being assessed by the items within the measurement scale. Calculation of the measure's Cronbach's alpha is the typical indicant of internal consistency. Although a definitive statistical magnitude to determine acceptance or rejection of a measures' internal consistency does not exist, Nunnally and Bernstein (1994) recommend a minimum alpha value of 0.70.

Temporal stability is concerned with the stability of a measure over time. In any research context, it is important to demonstrate that measurements separated in time are highly correlated, unless of course, the construct is assumed to vary over time (DeVellis, 2003). Temporal stability should be examined because confidence in the measure is based on the measure's ability to accurately reflect the variability or lack thereof of the construct over time. For self-efficacy and outcome expectations, unless individuals are well practiced at the behavioral performance underscoring their efficacy beliefs and expectations and/or unless a challenge to self-regulation occurs, one might expect a small degree of instability over a short time period (cf. Dawson & Brawley, 2000).

**Purpose**

The overall purpose of this self-efficacy theory-based study (Bandura, 1997) was to develop and examine initial content and construct validity, as well as the internal consistency and temporal stability of measures to assess mothers' self-regulatory efficacy to schedule/plan, self-regulatory efficacy to overcome barriers, and outcome expectations (likelihood and value) to transport their preschool children to SPA. To address the overall purpose, the study had three phases:

**1) Phase 1** used self-efficacy theory (Bandura, 1997) to identify and define a conceptual framework for mothers transporting their preschool aged children to SPA [construct validity],

**2) Phase 2** used past literature and focus groups of mothers who had children involved in SPA to develop items for the measures [content and construct validity],

**3) Phase 3** used expert judges' feedback and two reliability studies involving mothers of preschool aged children involved in SPA in order to optimize the length of each measure and to examine internal consistency and temporal stability [reliability].

## METHODS

The procedures for study phases 1 through 3 are presented in the following sections. Since phases 1 and 2 involved measurement development and an iterative process of refinement, results are also presented in the corresponding procedures sections. The procedures for Phase 3, involving reliability testing of the measures in larger samples, are also outlined below. However, participant demographics and results from the two studies in Phase 3 are presented in the results section (see Figure 2.1). The University of Saskatchewan Behavioral Review Board approved the study, prior to participant recruitment (see Appendix A).

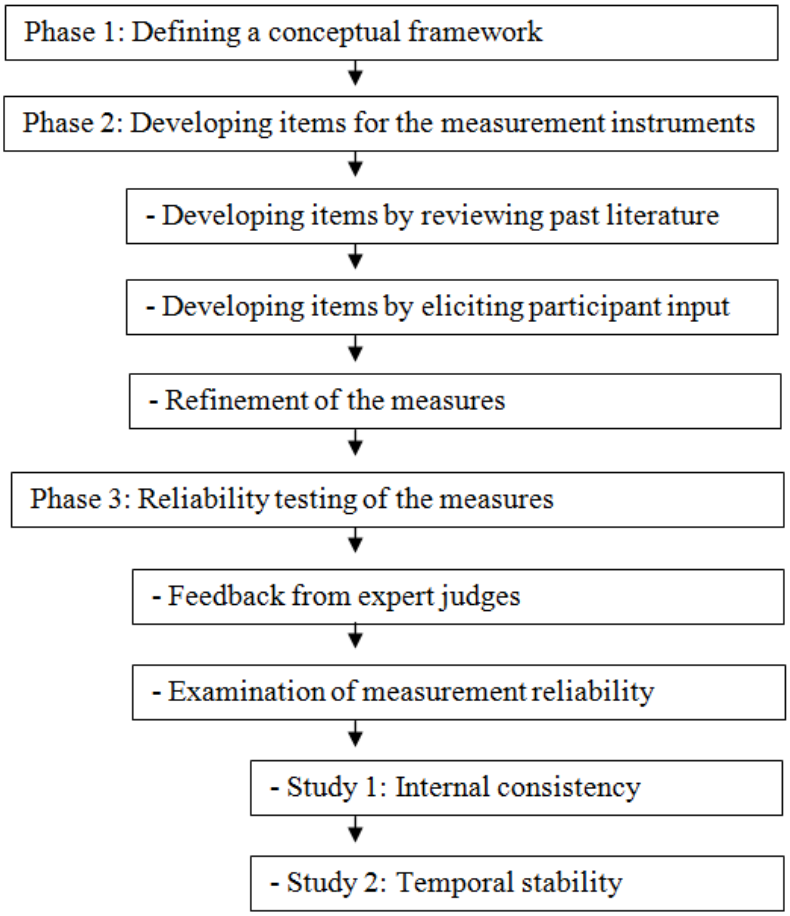


Figure 2.1. Outline of Study 1.

**Phase 1 Procedures: Defining a Conceptual Framework**

To begin to establish construct validity of the measures, a precise and detailed understanding of the: (a) task domain and (b) theoretical context of the constructs to be measured was undertaken (Clark & Watson, 1995; Hambleton, 1984). The task domain was understood by distinguishing the characteristics of the given task under study from other mother-child tasks in the physical activity domain. The given task was *the transportation of a preschool aged child to regularly scheduled SPA by a mother*.

Two main characteristics set this task apart from other mother-child tasks in the broader physical activity domain (for a review of factors influencing physical activity for preschool children see Timmons, 2005). First, differentiating SPA from unstructured activities provides greater internal control and unidimensionality of a construct, which in turn, potentially enhances the possibilities to provide validity and reliability evidence for the measures (cf. Clark & Watson, 1995). Second, the recurring nature of transporting a child to SPA differentiated this task from other mother-child SPA-related tasks, such as the one-time only task of registering a child for SPA (McMinn et al., 2009; Welk, Wood, & Morss, 2003). The distinction between transporting a child, which is a motivated and recurring behavior, and registering a child, which is a one-time behavior, required the investigation of theory-based social cognitions that may impact the transportation behavior over time (Bandura, 1997).

Next, understanding the theoretical context of the constructs to be measured began with their conceptual definitions and hypothesized relationships to the task, which were grounded in self-efficacy theory (Bandura, 1997). The resulting model used throughout the study is seen in Figure 2.2. Self-regulatory efficacy to overcome barriers was conceptualized as the mother's belief in her ability to transport her child to scheduled SPA in the face of barriers. Self-regulatory efficacy to schedule/plan was conceptualized as the mother's belief in her ability to plan and

schedule courses of action needed to transport her child to scheduled SPA. Outcome likelihood was conceptualized as the mother's beliefs in the probability that positive, proximal consequences for her child would result from taking her child to the scheduled SPA. Outcome value was conceptualized as the mother's beliefs in the importance of the positive, proximal consequences for her child that would result from taking her child to the scheduled SPA. According to Bandura (1997), these efficacy beliefs and outcome expectations may be related to whether mothers transport their children to SPA.

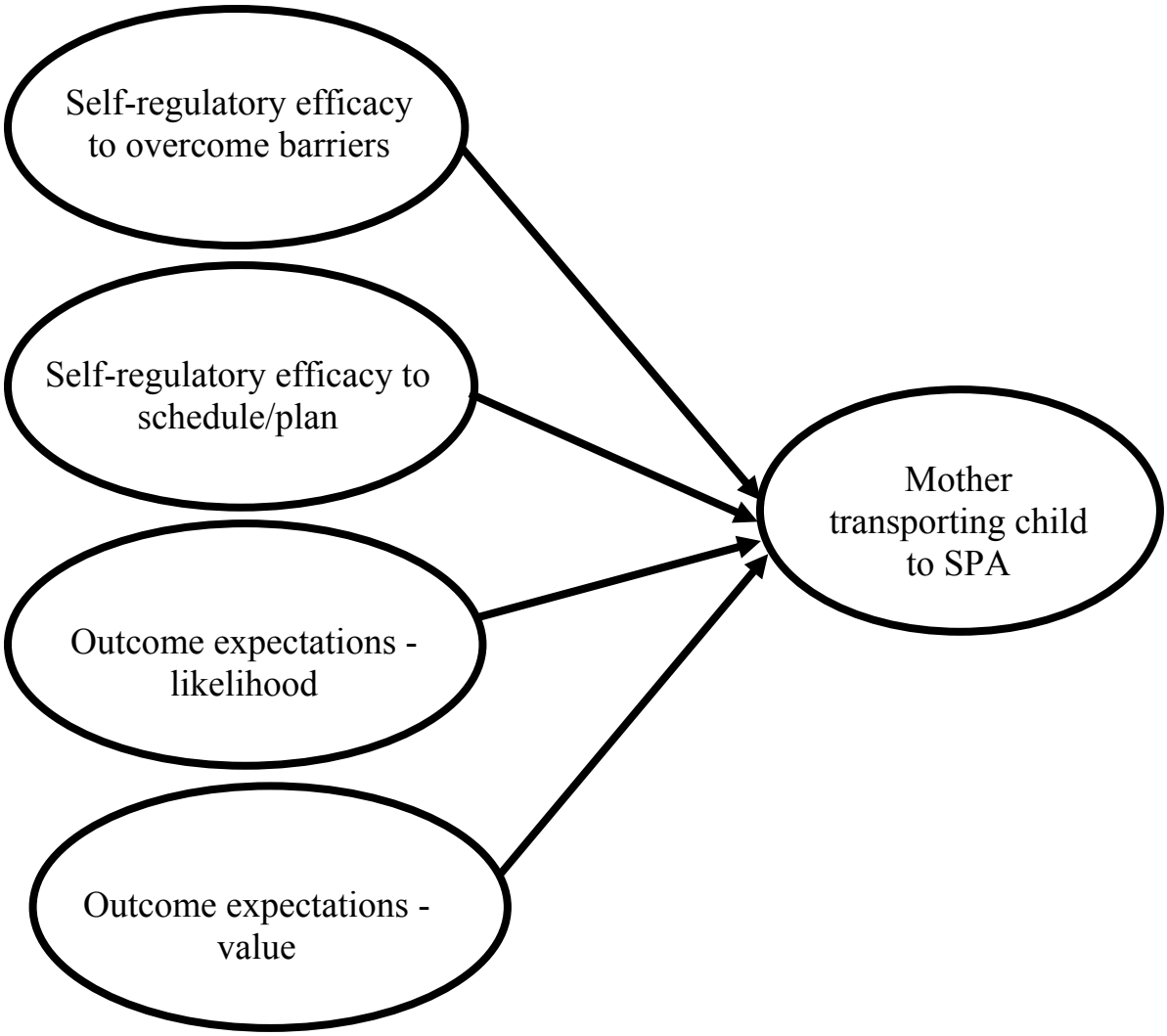


Figure 2.2. The conceptual model for a mother transporting her preschool aged child to structured physical activity (SPA) included: self-regulatory efficacy to overcome barriers, self-regulatory efficacy to schedule/plan, outcome likelihood, and outcome value.

**Phase 2 Procedures: Developing Items for the Measures**

Phase 2 procedures involved a review of literature and focus group discussions, which served as evidence for the content validity of the measures.

**Developing items by reviewing past literature.** The initial list of items for each measure was drawn from a review of academic and popular press print and web-based resources that were related to a mother's abilities to facilitate her child's SPA (e.g., encyclopedia articles, parenting books, and academic journals). A total of 60 resources were reviewed (see Appendix B for the resources). Concepts and/or issues illustrative of self-regulatory efficacy to overcome barriers and to schedule/plan as well as expected outcomes of a child's involvement in SPA were documented. A total of 60 self-regulatory efficacy-related and 114 outcome expectancy-related items were identified (see Appendix C for the list of items).

**Developing items by eliciting participant input.** Focus group discussions were used to elicit participant input, which encouraged greater content variability and item development, using words and concepts representative and relevant to the participants, themselves (cf. DeVellis & DeVellis, 2001; Sherif & Sherif, 1969). The focus groups were also used to reduce the 60 self-regulatory efficacy and 114 outcome expectation items to a smaller number of items, which would reduce subject burden in Phase 3. Participants were recruited from personal contacts and the snowballing technique (Glaser & Strauss, 1967; see Appendix D for recruiting announcements and consent forms for Study 1). Each focus group lasted approximately 60 minutes and was tape-recorded. Nine mothers participated in the two focus groups (Group 1: $n$ = 6, Group 2: $n$ = 3). All participants were white, married, and between 31 and 40 years of age ($M_{age}$ = 35.25; $SD$ = 3.57). Four participants reported their family income was over $100,000, four participants reported their family income was between $75,000 - $90,000 and one participant reported her family income was $45,000 - $75,000. Five participants held a Master's,

Doctor of Philosophy, or professional degree, two participants held a Bachelors degree, and two participants had some college education.

The groups were asked three main open-ended questions (see Appendix E for the interview guide). First, participants were asked to specify the self-regulatory behaviors they had to perform so their child could participate in SPA. Second, participants detailed how they organized their life so their child could participate in SPA (i.e., what self-regulatory challenges were present and how did the mothers overcome the challenges). Third, participants were asked what motivated them to have their child participate in SPA (i.e., what outcomes were expected). As previously mentioned, due to the paucity of research on outcome expectations in this area, participants were asked to report outcomes for both her child and herself. Feedback from the participants during the focus groups indicated that all participants were motivated by the outcomes for their child. Thus, only child-related outcomes were included in the measures.

Each focus group tape-recording was transcribed. The researcher reviewed the transcripts and, for each construct, developed a list of items. These lists were cross-referenced with the lists developed from the literature review. Items that appeared in both lists for each construct were retained (cf. Hinkin, 1995; Creswell, 2003; i.e., 30 self-regulatory efficacy and 58 outcome expectancy items; see Appendix C). It was necessary to conduct focus groups and to cross-reference the items identified in the focus groups with the literature review because the intention of the present study was to involve mothers as active agents in expressing their thoughts related to transporting their preschool aged child to SPA (cf. Carron, Widmeyer, & Brawley, 1985; Sherif & Sherif, 1969).

**Phase 3 Procedures**

Phase 3 procedures involved eliciting feedback from expert judges and examining the internal consistency and temporal stability of the measures, from samples of mothers of

preschool aged children participating in SPA that required transportation. Information collected in Phase 3 served as evidence for the content validity, construct validity, and reliability of the measures.

**Feedback from expert judges.** A convenience sample of three experts in exercise psychology, who have worked extensively with self-efficacy theory and, in particular, self-regulatory efficacy beliefs, were asked to judge the self-regulatory efficacy items retained from Phase 2. All three judges agreed to participate. The expert judges gauged the degree to which each item represented and matched its theoretically-based conceptual definition, which served as evidence for the content and construct validity of the measures. The 30 self-regulatory efficacy items, which included overcoming barriers and scheduling/planning, were presented to the judges via a web-based survey system. The judges provided feedback on: (a) the match between each item's content and conceptual definition using the following scale: 1 (*Definite feeling that it does match)*, 2 (*Undecided about whether it does match)*, or 3 (*Definite feeling that it does NOT match*), (b) the representativeness/importance of each item (open-ended response option), and (c) suggestions for improvements to the instructions, items, and/or other comments on the layout of the measure (open-ended response option). The researcher met with each judge to obtain any further verbal feedback.

Adjustments were made to the measures, if necessary, based on the aforementioned information and a decision making model. The decision making model included: (1) asking conceptual questions (i.e., how did the item fit within the conceptual model?), (2) simplifying (i.e., how well did the item represent the construct in a simple and meaningful manner?), and (3) consideration of the researcher's dilemma (i.e., all questions cannot be answered at one time, therefore, position the current research to facilitate future research; L.R. Brawley, personal

communication, July 2008). The self-regulatory efficacy to overcome barriers measure was reduced to 12-items and self-regulatory efficacy to schedule/plan was reduced to eight items (see Appendix F). An open-ended response option was also added to the self-regulatory efficacy measures so respondents in Phase 3 could write additional items salient to themselves. This option permitted the mothers to continue to be active agents in the process of instrument development (Sherif & Sherif, 1969).

The pool of outcome expectancy items at this point in the research process was large ($N$ = 58). Due to the high number of items and due to the time needed by the expert judges to assess the self-regulatory efficacy items, a decision was made to not ask the expert judges to also evaluate the outcome expectancy items. An alternative strategy was selected to review these items, which was similar to the use of the expert judges. Participants in the previously conducted focus groups, who themselves could be considered experts in transporting their children to SPA, were asked to review the items. For each of the 58 items, participants ($N$ = 8) were asked whether each outcome would result from transporting their children to SPA in the next 2 months on a scale of 1 (*strongly agree*) to 5 (*strongly disagree*).

Since the number of items in a scale can affect responses in different ways (e.g., fatigue and response pattern bias; DeVellis, 2003), it was important to maintain some consistency with the number of items retained to assess the self-regulatory efficacy constructs. Therefore, the eight outcomes that participants rated as being most relevant (i.e., agreement that the item would result from them transportation their children to SPA) were identified. A mean score for each item was calculated to determine which items this sample of participants ranked as the highest (the overall $M_{agreement}$ = 2.30, $SD$ = 0.90). The eight items with the highest mean agreement scores were retained (for the eight retained items: $M_{agreement}$ = 1.36, $SD$ = 0.14; see Appendix F).

**Examination of Measurement Reliability: Studies 1 and 2**

Two reliability studies were conducted with two separate samples of mothers of preschool aged children participating in SPA. The first study examined the internal consistency of each measure. The second study continued to examine internal consistency plus the temporal stability of each measure.

**Participant inclusion criteria for reliability studies 1 and 2.** Participant inclusion criteria for both studies included: (a) being a mother with a child between 2 to 5 years of age and (b) this child was currently participating in a SPA over the next four or more weeks. SPA was defined as *any physical activity your child has to be registered for that is organized and started by adults (e.g., community organizations/associations, clubs, leisure facilities, etc.)* (NASPE, 2002). These criteria ensured that participants had a minimum experiential basis from which they could respond to the study measures. For each study, demographic characteristics of the mother and child of focus (e.g., mother's age, level of education, family income, child's age) were also obtained on the surveys.

**Recruitment strategies for reliability studies 1 and 2.** Recruiting announcements for both web-based studies included information about the purpose and procedures, the web address to the survey, and the researcher's contact information. Six recruitment strategies were used in both studies: (1) the snowballing technique, (2) contacting on-line niche communities (e.g., Canadian Moms Online, Mothers of Preschoolers, Work at Home Mom Canada, City Parent.com, Canadian Moms Community), (3) contacting large virtual communities (e.g., Facebook, Kijiji, YouTube, Craig's List), (4) postings in newsletters (e.g., Saskatoon community associations, Saskatoon leisure services), (5) life path posters (e.g., poster that could be viewed at preschools/day cares, libraries, and health clubs/recreation facilities), and (6) *in Motion* representatives of the Early Years Strategy helped to recruit participants (i.e., emails were sent to

*in Motion* Early Years contacts with the request that they post and/or pass along the information). The diverse recruiting strategies were used to reduce the potential for any biased sampling from the population.

**Procedures for reliability studies 1 and 2.** The first study involved recruiting participants to complete a web-based survey to collect responses to the self-regulatory efficacy and outcome expectation measures. The researcher also conducted one-on-one interviews with 10 participants as they completed the web-based survey measures. The participants were asked to think out loud, ask questions, and voice concerns about the instructions and item content while completing the survey. The think out loud sessions functioned as a quality check and provided information about participants' thoughts as they were answering each item. The researcher could then compare the participants' thoughts with the researcher's theory-based conceptualization of the items in order to determine if they were thinking about the items in the same, intended way (Harrison, McLaughlin & Coalter, 1996). At the end of Study 1, minor changes to the measures were made. These changes were based on the feedback from the 10 think out loud sessions (i.e., minor wording and layout adjustments), the results from the internal consistency analyses, and three criteria the researcher considered. These criteria were: (1) increasing the ease of completion of the measures (i.e., decreasing participant burden), (2) capturing an accurate representation of the constructs (i.e., guarding against construct under-representation), and (3) maintaining acceptable internal consistency for each scale (DeVellis, 2003).

In the second study, mothers of preschool aged children participating in SPA completed two web-based surveys, one week apart, of the social cognitive measures in order to examine, in part, test-retest reliability. A one-week time frame was chosen so participants did not simply recall their answers on the time 1 survey while responding to the same measures at time 2, while,

also not being too long of a time such that the social cognitions changed. Research announcements invited individuals to access the initial survey at a provided web address. An email with a link to the final survey was sent to each participant, approximately seven days later. Participants who did not complete the final survey within a week were sent an additional email reminder. On average, participants completed their two surveys nine days apart from each other.

**Measures for reliability studies 1 and 2.** The first page of the web-based surveys used in both studies included informed consent. Participants were informed that by completing the survey, they were consenting to participate. As a control definition, SPA was defined as *any physical activity your child has to be registered for that is organized and started by adults (e.g., community organizations/associations, clubs, leisure facilities, etc.;* NASPE, 2002). As an additional control mechanism, participants were asked to focus their responses on the one SPA that their child would participate in most often in the next four weeks.

The surveys in both studies included the following measures: (1) self-regulatory efficacy to overcome barriers, (2) self-regulatory efficacy to schedule/plan, (3) outcome likelihood, and (4) outcome value. See Appendix F for all of the items used in Study 1 and see Table 2.1 for all of the items used in Study 2.

**Self-regulatory efficacy to overcome barriers.** To assess self-regulatory efficacy to overcome barriers, participants were presented with the stem: "*In the next 4 weeks, I am confident I can take my child to the activity even if…"*. Then, in line with recommendations (Bandura, 1997) and similar to prior research in the physical activity domain (Woodgate, 2005; Woodgate et al., 2005), participants reported their self-regulatory efficacy to overcome each barrier item on a response scale ranging from 0% (*not at all confident)* to 100% (*completely confident)*. A response option of "*not applicable*" (N/A) was available for each item. This option

ensured that participants responded to only those items that were relevant to them (cf. Brawley et al., 1998).

**Self-regulatory efficacy to schedule/plan.** For self-regulatory efficacy to schedule/plan, participants were presented with the stem: "*In order to take my child to the activity in the next 4 weeks, I am confident I can…*", followed by the scheduling/planning items and a response scale ranging from 0% (*not at all confident)* to 100% (*completely confident)*. Participants also had the option to respond with N/A on each item.

**Outcome likelihood.** For outcome likelihood, participants were presented with the stem: "*Because you will take your child to the activity in the next 4 weeks, how likely is it your child will…"*, followed by the likelihood items. The response scale ranged from 1 *(not at all likely)* to 10 *(extremely likely)*.

**Outcome value.** For outcome value, participants were presented with the stem: *"How much do you value your child…",* followed by the value items and a response scale ranging from 1 (*not at all valued)* to 10 *(highly valued)*. A N/A response option was also available for all likelihood and value items. Assessment of likelihood and value in this manner was modeled after past research in the physical activity domain (see Williams et al., 2005 for a review).

**Data Analyses**

In studies 1 and 2, descriptive statistics, such as means, standard deviations, and percentages were calculated for the participant demographic and the social cognitive variables. A *p* level of .05 (two-tailed) was used to determine significance for all statistical tests. Analyses were conducted using SPSS version 16.0 (SPSS Inc. Chicago, IL).

In Study 1, the internal consistency for each measure was assessed using Cronbach's alpha (Cronbach, 1951; DeVellis, 2003). Interpretation of the alpha value was based on

recommendations by Nunnally & Bernstein (1994) (i.e., $\alpha > 0.70$ is acceptable). Inter-item correlation matrices for the self-regulatory efficacy scales were used to identify highly correlated items (e.g., $r = 0.80$, Tabachnik & Fidell, 2007). In such cases, the item that best represented the conceptual, theory-based definition of the construct, and was not confounded with more than one concept, was retained for Study 2, with the other item being removed. In Study 2, the internal consistency of each measure was investigated again, at both time periods of assessment. Temporal stability was also assessed using Pearson correlations (i.e., Burlingame, Lambert, Reisinger, Neff, & Mosier, 1995 suggest $r = .70$ as the minimum standard for temporal stability) and paired t-tests. Means and standard deviations of items with significant Pearson correlations between scale items, as well as between the items and overall scale mean and/or significant paired *t*-tests between scale items were examined for meaningful change over time (i.e., the type of change in which the item scores moved to a different range on the measurement scale, e.g., completely confident to somewhat confident; DeVellis, 2003). In the case of both significant and meaningful change, further considerations of the effect of deleting the item on the overall validity of the scale, the internal consistency of the scale, and concerns related to construct under-representation were made (Nunnally & Bernstein, 1994).

Table 2.1

Items for Self-regulatory Efficacy and Outcome Expectation Measures

| Self-regulatory efficacy to overcome barriers – Items |
|---|
| My house is not clean and I am expecting guests |
| Another family member (like my partner or parents) needs me to spend time with them at the same time as the activity |
| I am sick |
| My other child(ren) is/are sick |
| **Self-regulatory efficacy to schedule/plan – Items** |
| Schedule my family's other commitments (e.g., holidays) |
| Change my personal physical activity schedule |
| Plan ahead so other activities will not interfere with taking my child to the activity |
| Pack the things my child needs for the activity ahead of time |
| Prepare my child (get dressed, fed, etc) for the activity ahead of time |
| **Outcome expectation likelihood and value – Items** |
| Build her/his self-confidence to try new activities |
| Develop strong muscles |
| Burn off energy |
| Increase her/his self-confidence to do an activity without her/his parents |
| Become more comfortable around children her/his own age |
| Make new friends |
| Develop specific movement skills |
| Develop a habit for lifelong physical activity participation |

## RESULTS

Recall that Phase 3 of the study included two reliability studies. The results of Study 1 are presented first followed by the results of Study 2. Participant demographics are also presented in each section.

### Phase 3, Study 1: Internal Consistency of the Measures

**Participants.** A total of 63 individuals accessed the web-based survey containing the measures of self-regulatory efficacy to overcome barriers, self-regulatory efficacy to schedule/plan, outcome likelihood, and outcome value. Thirty-two of the 63 mothers (50.79%) indicated their child was not participating in a SPA in the next four weeks and therefore completed only demographic questions and exited the survey (i.e., did not meet participant inclusion criteria). The mean age of the remaining 31 participants was 33.50 years ($SD$ = 5.79). Most participants reported their family income was more than $100,000 ($n$ = 10) or $45,000-75,000 ($n$ = 10). A majority of the participants were married ($n$ = 26; see Table 2.2 for additional demographic characteristics of study participants). Recruitment and data collection was conducted over a 4-month period.

To determine whether the study participants and their child of focus (i.e., child who was being transported to SPA) differed from the non-participants and their child of focus in demographics, Pearson chi-square analyses and independent $t$-tests were conducted. Participants with a child registered for SPA had a significantly higher family income ($\chi^2 = 6.18$, $df = 2$, $N = 58$, $p < .05$) and education ($\chi^2 = 7.74$, $df = 2$, $N = 63$, $p < .05$) than participants without a child registered. No other significant differences were found on any other demographic variables (see Appendix G).

Among the study participants, 22 individuals indicated their child was scheduled to participate in SPA on one day each week, eight participants indicated their child was scheduled

for two days each week, and one participant indicated her child was scheduled for three days each week during the next four weeks. On average, the total number of days the children were scheduled to participate across the next four weeks was 5.29 days (*SD* = 2.16).

Table 2.2

Demographic Characteristics of Participants in Reliability Study 1 (*n* =31)

| | *n* (Percentage) | *M* | *SD* |
|---|---|---|---|
| Number of children in household | 31 (100.00) | 1.90 | 0.83 |
| Age of focus child (years) | 31 (100.00) | 3.39 | 1.05 |
| Age of mother (years) | 30 (96.77) | 33.50 | 5.79 |
| Gender of focus child | | | |
| Female | 13 (41.93) | | |
| Male | 18 (58.06) | | |
| Family Income | | | |
| <$25,000 | 1 (3.22) | | |
| $25-45,000 | 4 (12.90) | | |
| $45-75,000 | 10 (32.25) | | |
| $75-90,000 | 2 (6.45) | | |
| $90-100,000 | 3 (9.67) | | |
| >$100,000 | 10 (32.25) | | |
| No Response | 1 | | |
| Relationship Status | | | |
| Married | 26 (83.87) | | |
| Not Married Living with a partner | 3 (9.67) | | |
| Have a partner, not living together | 0 | | |
| Separated | 1 (3.22) | | |
| Single-Never Married | 1 (3.22) | | |
| Mother's Education | | | |
| Less than university | 12 (38.70) | | |
| University or advanced | 19 (61.30) | | |
| Partner's Education | | | |
| Less than university | 12 (38.71) | | |
| University or advanced | 18 (58.06) | | |
| No Response | 1 | | |

**Internal consistency results.** Cronbach's alpha for the 12-item self-regulatory efficacy to overcome barriers scale was 0.91, which is acceptable according to the criteria set for this study (Nunnally & Bernstein, 1994). The inter-item correlation matrix indicated that all items correlated significantly with the mean overall score on the scale (see Table 2.3). Among the items, the strongest positive correlation was between the *"Cannot leave work"* and *"Need to work"*, $r$ (31) = 0.85, $p < .001$. Given the high Cronbach's alpha value, some redundancy between the items existed (Tabachnik & Fidell, 2007) and, thus, some items could be deleted from the scale without compromising its internal consistency. A total of eight items were removed: four items were removed based on the fact that 12 or more participants (i.e., 39% or more of the sample) responding with N/A and an additional four items were removed based on their high inter-item correlations with other items. Thus, the scale was reduced from 12 to four items. The internal consistency of the final four items, representing the self-regulatory efficacy to overcome barriers construct, maintained an acceptable internal consistency level when re-analyzed ($\alpha = 0.72$).

Cronbach's alpha for the eight-item self-regulatory efficacy to schedule/plan scale was acceptable at 0.79. The inter-item correlation matrix indicated that all of the items were significantly correlated with the overall mean self-regulatory efficacy to schedule/plan (see Table 2.4). The strongest positive correlation was between the items *"Change work schedule"* and *"Change my physical activity schedule"*, $r$ (31) = 0.98, $p < .001$. Two other pairs of items were highly correlated with one another, "*Prepare child ahead of time*" and "*Pack things ahead of time*", $r$ (31) = 0.92, $p < .001$, and "*Schedule family's other commitments*" and "*Keep schedule flexible*", $r$ (31) = 0.92, $p < .001$. The item "*Prepare child ahead of time*" was not significantly correlated with any other item and had non-significant negative correlations with three of the

seven other items (see Table 2.4). Although the Cronbach's alpha was at an acceptable level, other considerations were taken into account requiring scale reduction. One item was removed based on 12 participants (i.e., 39% of the sample) responding with N/A and two items were removed based on high inter-item correlations with other items. Thus, the scale was reduced from eight to five items. The five items, representing the self-regulatory efficacy to schedule/plan construct, maintained acceptable internal consistency upon re-analysis ($\alpha = 0.74$).

Cronbach's alpha for the eight-item outcome likelihood scale used was acceptable at 0.89. The inter-item correlation matrix indicated that all items were significantly correlated with mean outcome likelihood (Table 2.5). The strongest positive correlation was between the item "*Confidence do activity without parents"* and *"Make new friends", r* (31) = 0.71, $p < .001$.

Cronbach's alpha for the eight-item outcome value scale was also acceptable at 0.79. The inter-item correlation matrix for the outcome value items indicated the items "*Confidence to try new activities*" and "*Movement skills*" were not significantly correlated with mean outcome value (Table 2.6). All other items were significantly correlated with mean outcome value. The strongest positive correlation was between the items "*Confidence do activity without parents"* and *"Comfortable around children", r* (31) = 0.74, $p < .001$. A number of correlations for the items "*Confidence to try new activities*" and "*Movement skills*" also revealed no relationships or small, not significant, negative relationships with other items (Table 2.6). For example, the correlation for the items "*Confidence to try new activities*" and "*Movement skills*" was *r* (31) = -0.03, $p > .05$.

Despite such findings, overall, for both outcome likelihood and value, Cronbach's alphas were above the acceptable guideline. Furthermore, participants responded to all of the items (i.e., 0 participants responded with N/A) and inter-item correlations did not reveal any highly

correlated items. Although two outcome value items were not significantly correlated with the mean outcome value scale and revealed no relationship or weak, negative relationships with other items, these items did not reveal any cause for elimination in the outcome *likelihood* measure. Thus, in order to maintain the same outcome likelihood and value items, as is standard practice in the outcome expectation-activity research (Rodgers & Brawley, 1991; Rodgers & Gauvin, 1998) and is in line with self-efficacy theory contentions that both aspects of outcomes expectations are important for motivated behavior to take place (Bandura, 1997), no items were removed on these measures at this time.

Table 2.3

Self-regulatory Efficacy (SRE) to Overcome Barriers Inter-Item Correlations ($n$ = 31)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. House is not clean[+] | | | | | | | | | | | | |
| 2. Family member needs me[+] | .36* | | | | | | | | | | | |
| 3. Need to work | .62** | .26 | | | | | | | | | | |
| 4. I am sick[+] | .57** | .37* | .34 | | | | | | | | | |
| 5. Weather is very bad | .36* | .51** | .55** | .20 | | | | | | | | |
| 6. Child having 'melt down' | .35* | .55** | .33 | .53** | .60** | | | | | | | |
| 7. Only one vehicle | .39* | .44* | .66** | .08 | .61** | .47** | | | | | | |
| 8. Cannot leave work | .35* | .38* | .84** | .17 | .62** | .36* | .74** | | | | | |
| 9. Car breaks down | .23 | .47** | .42* | .35* | .50** | .50** | .66** | .42* | | | | |
| 10. Cannot find the equipment | .45* | .35* | .48** | .32 | .52** | .75** | .61** | .40* | .52** | | | |
| 11. Somebody watch other child | .46** | .75** | .34 | .24 | .63** | .62** | .57** | .46** | .47** | .53** | | |
| 12. Other child sick[+] | .30 | .60** | .21 | .15 | .41* | .38* | .52** | .31 | .45** | .38* | .65** | |
| 13. Mean SRE barriers | .60** | .68** | .74** | .54** | .77** | .73** | .77** | .72** | .73** | .69** | .68** | .54** |

[+] Item used on final version of the measure

*$p < 0.05$

**$p < .01$.

Table 2.4

Self-regulatory Efficacy (SRE) to Schedule/Plan Inter-Item Correlations ($n$ = 31)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1. Schedule family's other commitments[+] | | | | | | | | |
| 2. Keep schedule flexible | .92** | | | | | | | |
| 3. Change work schedule | .26 | .45* | | | | | | |
| 4. Change my physical activity schedule[+] | .22 | .42* | .98** | | | | | |
| 5. Prepare in advance | .25 | .27 | .32 | .31 | | | | |
| 6. Plan ahead[+] | .36* | .48** | .79** | .80** | .33 | | | |
| 7. Pack things ahead of time[+] | .47** | .53** | .17 | .18 | .06 | .40* | | |
| 8. Prepare child ahead of time[+] | .30 | .35 | -0.06 | -0.06 | -0.05 | .11 | .92** | |
| 9. Mean SRE to schedule/plan | .75** | .86** | .62** | .61** | .54** | .69** | .70** | .49** |

[+] Item used on final version of the measure

*$p < 0.05$

**$p < .01$.

Table 2.5

Outcome Likelihood Inter-Item Correlations ($n$ =31)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1. Confidence to try new activities | | | | | | | | |
| 2. Strong muscles | .45** | | | | | | | |
| 3. Burn off energy | .42* | .68** | | | | | | |
| 4. Confidence do activity without parents | .48** | .64** | .28 | | | | | |
| 5. Comfortable around children | .43* | .63** | .53** | .54** | | | | |
| 6. Make new friends | .62** | .49** | .24 | .71** | .41* | | | |
| 7. Movement skills | .56** | .65** | .50** | .55** | .47** | .56** | | |
| 8. Habit for lifelong physical activity | .32 | .50** | .33 | .55** | .46** | .41* | .65** | |
| 9. Overall mean outcome likelihood | .69** | .84** | .65** | .79** | .73** | .74** | .83** | .72** |

*$p < 0.05$

**$p < .01$.

Table 2.6

Outcome Value Inter-Item Correlations (*n* =31)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1. Confidence to try new activities | | | | | | | | |
| 2. Strong muscles | -0.06 | | | | | | | |
| 3. Burn off energy | .01 | .66** | | | | | | |
| 4. Confidence do activity without parents | .29 | .54** | .25 | | | | | |
| 5. Comfortable around children | .22 | .61** | .41* | .74** | | | | |
| 6. Make new friends | .26 | .51** | .27 | .70** | .73** | | | |
| 7. Movement skills | -0.03 | .24 | .20 | .01 | -0.18 | .01 | | |
| 8. Habit for lifelong physical activity | .50** | .13 | .27 | .15 | .25 | .23 | .30 | |
| 9. Overall mean outcome value | .33 | .78** | .63** | .79** | .82** | .80** | .25 | .47** |

*$p < 0.05$

**$p < .01$.

**Phase 3, Study 2: Examination of the Reliability (Internal Consistency; Temporal Stability) of the Measures**

**Participants.** A total of 215 individuals accessed the first web-based survey. One hundred and twenty-four mothers (57.67%) indicated their child was participating in a SPA in the next four weeks and were invited to complete the remainder of the survey (i.e., demographics, self-regulatory efficacy to overcome barriers and to schedule/plan, outcome likelihood and value). Ninety-one mothers indicated their child was not participating in any SPA in the upcoming four weeks and completed the demographic questions of the survey only.

To determine whether the study participants and their child of focus differed from the non-participants and their child of focus in demographics, Pearson chi-square analyses and independent *t*-tests were conducted. Participants with a child registered for SPA had a significantly higher family income ($\chi^2 = 8.60$, $df = 2$, $N = 210$, $p < .05$) and education ($\chi^2 = 11.53$, $df = 2$, $N = 213$, $p < .05$), than participants without a child registered. Further, study participants were significantly older ($t$ (207) = 2.19, $p < .05$; $M_{\text{study participants}} = 32.61$ years, $SD = 4.38$; $M_{\text{non-participants}} = 31.14$ years, $SD = 5.30$) and their children of focus were older ($t$ (212) = 4.83, $p < .05$; $M_{\text{child registered}} = 3.77$ years, $SD = 0.99$; $M_{\text{child not registered}} = 3.09$ years, $SD = 1.08$). No other significant differences were found on any other demographic variable (see Appendix G). Of the 124 participants who had a child participating in SPA and began the survey, an additional 19 mothers were excluded. Review of their survey responses indicated that the children of 15 mothers were not participating in SPA for four or more weeks. Four other mothers indicated in the open-ended barrier response category that they were not responsible for transporting their child to the SPA (e.g., "*Our Nanny takes him [the child] to his "sportsstars" class. I am at work*"). This brought the sample size at baseline to 105. To determine whether these 105 study participants and their child of focus differed from the 110 non-participants (i.e., original 91 plus

19 further mothers) and their child of focus in demographics, Pearson chi-square analyses and independent *t*-tests were conducted again. Similar to the previous analyses, study participants had significantly higher education ($\chi^2 = 10.80$, $df = 3$, $N = 212$, $p < .05$), than non-participants. Further, the child of focus of the study participants were significantly older ($t$ (212) = 4.50, $p < .05$; $M_{\text{study participant child}} = 3.81$ years, $SD = .98$; $M_{\text{non-participant child}} = 3.17$ years, $SD = 1.08$). No other significant differences were found on any other demographic variable.

Of the 105 study participants, 15 participants did not complete the final survey. The remaining 90 participants (85.71%) completed the final survey, on average, nine days after the initial survey. Recruitment and data collection for these 90 participants occurred over a 2-month period. Of these participants, 26 indicated their child had less than four weeks left in the SPA, therefore, they did not complete the final survey (see Figure 2.3). This left 64 participants ($M_{\text{age}} = 32.87$; $SD = 4.48$) with complete data for the initial and final assessments (see Table 2.7 for their demographics). Participants who completed the initial survey only and participants completing both the initial and final surveys did not significantly differ in demographics or initial social cognitive scores (overall mean score for each measure).

For the initial survey, 75 children were registered in only one activity during the upcoming four weeks, 44 children were registered in two activities concurrently, and five children were registered in three concurrent activities. As in reliability Study 1, participants were asked to focus on the one activity in which their child was participating in most often during the next four weeks. Table 2.8 presents the number and percentage of children registered in each SPA.

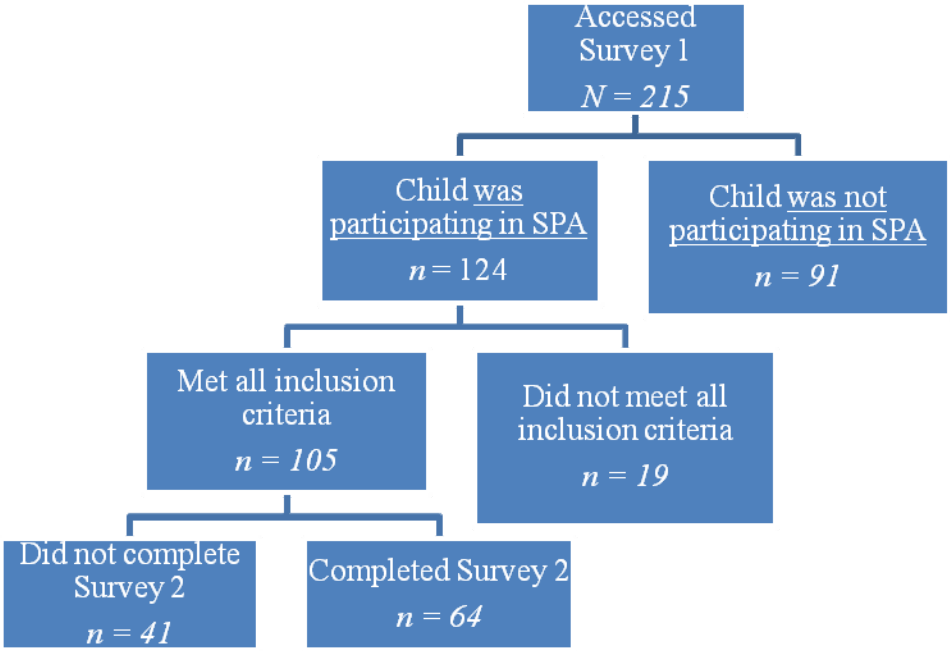


Figure 2.3. Phase 3, Study 2: Flow chart of study participants ($n$ = 64) and non-participants ($n$ = 151)

Table 2.7

Participant Demographics in Reliability Study 2 ($n$ = 64)

| | | *n* (Percentage) |
|---|---|---|
| Relationship Status | | |
| | Married | 53 (82.80) |
| | Separated | 4 (6.30) |
| | Not Married Living w/ partner | 3 (4.70) |
| | Single-Never Married | 2 (3.10) |
| | Divorced | 2 (3.10) |
| | Have a partner not living together | 0 (0.00) |
| Family Income | | |
| | <$45,000 | 15 (23.40) |
| | $45-90,000 | 25 (39.10) |
| | >$90,000 | 22 (34.40) |
| | No Response | 2 |
| Mother's Education | | |
| | High school or less | 4 (6.30) |
| | Some University | 34 (53.10) |
| | Post Graduate or more | 25 (39.10) |
| | No Response | 1 |
| Partner's Education | | |
| | High school or less | 9 (14.10) |
| | Some University | 33 (51.60) |
| | Post Graduate or more | 18 (28.10) |
| | No Response | 4 |

Table 2.8

Study 2: Types of SPA in which Children Were Registered

| Activity | *n* | Percentage |
|---|---|---|
| Dance | 16 | 25.00 |
| Swim | 15 | 23.40 |
| Gymnastics | 15 | 23.40 |
| Skating Lessons | 5 | 7.80 |
| Others | 4 | 6.30 |
| Soccer | 3 | 4.70 |
| Hockey | 3 | 4.70 |
| Taekwon-Do | 2 | 3.10 |
| Basketball | 1 | 1.60 |
| Total | 64 | 100 |

**Internal consistency results.** The Cronbach's alpha values for the four-item self-regulatory efficacy to overcome barriers measure was acceptable on the initial survey ($\alpha = 0.70$), and approached the acceptable level on the final survey ($\alpha = 0.66$). The Cronbach's alpha values for the five-item self-regulatory efficacy to schedule/plan measure was not at an acceptable level on the initial survey ($\alpha = 0.53$), but acceptable on the final survey ($\alpha = 0.80$). Cronbach's alpha values for both of the outcome likelihood and value measures were acceptable at both time periods (likelihood: $\alpha_{initial} = 0.88$, $\alpha_{final} = 0.87$; value: $\alpha_{initial} = 0.85$, $\alpha_{final} = 0.88$).

**Temporal stability results.** The temporal stability scores for the self-regulatory efficacy to overcome barriers measure varied, with Pearson correlations for the four individual items ranging from 0.57 to 0.87, with a median of 0.70 ($p < 0.01$ for all items) (Table 2.9). The temporal stability for the overall mean score was adequate at 0.74 ($p < 0.01$) (Burlingame et al., 1995) (Table 2.9). The paired *t*-tests revealed a significant difference between the initial and final surveys for the barrier "*I am sick*" ($M_{initial} = 72.97$, $M_{final} = 78.28$, $p < 0.05$; Table 2.10). No other items significantly differed over time.

The temporal stability for the self-regulatory efficacy to schedule/plan measure also varied, with Pearson correlations for the five individual items ranging from -0.02 to 0.77, with a median of 0.49 ($p < 0.01$ for all but one item) (Table 2.9). The temporal stability for the overall mean score was less than adequate at 0.46 ($p < 0.01$) (Table 2.9). The Pearson correlations for the item "*I can plan ahead so nothing will interfere*" was non-significant and approached no relationship at -0.02 ($p > .05$). The paired *t*-tests revealed only one significant difference between the initial and final surveys, which was for the scheduling/planning item "*I can prepare my child for the SPA ahead of time*" ($M_{initial} = 98.41$, $M_{final} = 95.94$, $p < 0.05$; Table 2.10).

The Pearson correlations assessing the temporal stability of the outcome likelihood scale ranged from 0.37 to 0.87, with a median of 0.54 ($p < 0.01$ for all items; Table 2.11). The overall mean score also had adequate temporal stability at 0.88 ($p < 0.01$; Table 2.11). The paired *t*-tests assessment revealed a significant difference between the initial and final surveys for the outcome "*My child will build her/his confidence to try new activities*" ($M_{initial} = 9.20$, $M_{final} = 9.56$, $p < 0.05$; Table 2.12).

Similar to the above findings, the Pearson correlations for the eight individual outcome value items ranged from 0.43 to 0.90, with a median of 0.64 ($p < 0.01$ for all; Table 2.11). The temporal stability for the overall mean score was also adequate at 0.84 ($p < 0.01$; Table 2.11). The paired *t*-tests revealed no significant differences between the initial and final survey items.

Table 2.9

Pearson Correlations for Self-regulatory Efficacy (SRE) Scales ($n$ = 64)

| | Pearson correlation coefficient ($p$ value) |
|---|---|
| SRE to overcome barriers | |
| Overall score | .74 (< .01) |
| Even if my house is not clean and I am expecting guests | .87 (< .01) |
| Even if another family member needs me to spend time with them | .57 (< .01) |
| Even if I am sick | .70 (< .01) |
| Even if my other child(ren) is/are sick | .71 (< .01) |
| SRE to schedule/plan | |
| Overall score | .46 (< .01) |
| I can schedule family's other commitments | .49 (< .01) |
| I can change my personal physical activity schedule | .40 (< .01) |
| I can plan ahead so nothing will interfere | -.02 (> .05) |
| I can pack the things my child needs for the SPA ahead of time | .52 (< .01) |
| I can prepare my child for the SPA ahead of time | .77 (< .01) |

Table 2.10

Change in Means Scores from Initial to Final Assessment of Reliability Study 2 (i.e., Average 9 Day Interval; $n = 64$)

| | $M_{Initial}$ (*SD*) | $M_{Final}$ (*SD*) | $M_{Change}$ (95% CI) | *p* value |
|---|---|---|---|---|
| Self-regulatory efficacy to overcome barriers | | | | |
| Overall score | 80.69 (18.41) | 83.03 (17.84) | -2.34 (-5.63 to .94) | 0.16 |
| Even if my house is not clean and I am expecting guests | 95.74 (13.35) | 95.83 (15.10) | -.17 (-2.10 to 1.76) | 0.86 |
| Even if another family member needs me to spend time with them | 92.76 (14.73) | 92.36 (14.14 | .00 (-3.64 to 3.64) | 1.00 |
| Even if I am sick | 72.97 (27.06) | 78.28 (24.85) | -5.31(-10.35 to -.28) | 0.04 |
| Even if my other child(ren) is/are sick | 60.36 (36.61) | 67.36 (35.63) | -6.41 (-13.99 to 1.15) | 0.10 |
| Self-regulatory efficacy to schedule/plan | | | | |
| Overall score | 97.09 (6.93) | 96.86 (7.36) | .23 (-1.62 to 2.08) | 0.80 |
| I can schedule family's other commitments | 95.01 (17.39) | 95.71 (13.41) | -.71 (-4.72 to 3.31) | 0.73 |
| I can change my personal physical activity schedule | 95.51 (17.46) | 97.38 (8.35) | -1.87 (-5.98 to 2.25) | 0.37 |
| I can plan ahead so nothing will interfere | 97.73 (9.23) | 97.94 (6.99) | -.202 (-3.15 to 2.75) | 0.89 |
| I can pack the things my child needs for the SPA ahead of time | 98.57 (4.67) | 97.14 (9.50) | 1.42 (-.607 to 3.46) | 0.17 |
| I can prepare my child for the SPA ahead of time | 98.41 (5.69) | 95.94 (10.03) | 2.47 (.80 to 4.14) | 0.00 |

Table 2.11

Pearson Correlations for Outcome Expectation Scales ($n$ = 64)

| | Pearson correlation coefficient ($p$ value) |
|---|---|
| Outcome likelihood | |
| Overall score | .88 (< .01) |
| My child will build her/his confidence to try new activities | .46 (< .01) |
| My child will build strong muscles | .76 (< .01) |
| My child will burn off energy | .37 (> .01) |
| My child will build her/his confidence do activities without parents | .62 (< .01) |
| My child will be more comfortable around children | .74 (< .01) |
| My child will make new friends | .79 (< .01) |
| My child will develop her/his movement skills | .69 (< .01) |
| My child will develop a habit for lifelong physical activity | .87 (< .01) |
| Outcome value | |
| Overall score | .84 (< .01) |
| My child will build her/his confidence to try new activities | .43 (< .01) |
| My child will build strong muscles | .75 (< .01) |
| My child will burn off energy | .82 (< .01) |
| My child will build her/his confidence do activities without parents | .53 (< .01) |
| My child will be more comfortable around children | .62 (< .01) |
| My child will make new friends | .90 (< .01) |
| My child will develop her/his movement skills | .80 (< .01) |
| My child will develop a habit for lifelong physical activity | .81 (< .01) |

Table 2.12

Change in Means Scores from Initial to Final Assessment of Reliability Study 2 (i.e., Average 9 Day Interval; $n = 64$)

| | $M_{Initial}$ ($SD$) | $M_{Final}$ ($SD$) | $M_{Change}$ (95% CI) | $p$ value |
|---|---|---|---|---|
| Outcome likelihood | | | | |
| Overall score | 8.89 (1.07) | 8.99 (0.96) | -.09 (-.22 to .03) | 0.13 |
| My child will build her/his confidence to try new activities | 9.20 (1.02) | 9.56 (0.79) | -.36 (-.60 to -.11) | 0.00 |
| My child will build strong muscles | 8.34 (2.10) | 8.42 (1.78) | -.08 (-.41 to .26) | 0.64 |
| My child will burn off energy | 9.41 (1.11) | 9.25 (1.38) | .15 (-.19 to .50) | 0.37 |
| My child will build her/his confidence do activities without parents | 9.09 (1.55) | 9.32 (0.94) | -.22 (-.52 to .08) | 0.14 |
| My child will be more comfortable around children | 9.14 (1.34) | 9.11 (1.34) | .03 (-.20 to .27) | 0.79 |
| My child will make new friends | 8.16 (2.14) | 8.28 (2.05) | -.12 (-.46 to .21) | 0.46 |
| My child will develop her/his movement skills | 9.17 (1.17) | 9.22 (1.10) | -.04 (-.27 to .17) | 0.67 |
| My child will develop a habit for lifelong physical activity | 8.66 (1.57) | 8.80 (1.39) | -.14 (-.33 to .04) | 0.14 |
| Outcome value | | | | |
| Overall score | 9.04 (1.03) | 9.09 (1.04) | -.04 (-.18 to .10) | 0.55 |
| My child will build her/his confidence to try new activities | 9.64 (0.72) | 9.69 (0.75) | -.04 (-.24 to .15) | 0.63 |
| My child will build strong muscles | 8.36 (2.10) | 8.67 (1.81) | -.31 (-.66 to .03) | 0.07 |
| My child will burn off energy | 9.11 (1.38) | 9.17 (1.28) | -.06 (-.26 to .13) | 0.53 |
| My child will build her/his confidence do activities without parents | 9.55 (0.79) | 9.34 (1.15) | .20 (-.04 to .45) | 0.10 |
| My child will be more comfortable around children | 9.17 (1.53) | 9.05 (1.68) | .12 (-.23 to .47) | 0.48 |
| My child will make new friends | 8.48 (2.13) | 8.47 (2.13) | .01 (-.23 to .25) | 0.93 |
| My child will develop her/his movement skills | 8.70 (1.87) | 8.92 (1.37) | -.22 (-.50 to .06) | 0.12 |
| My child will develop a habit for lifelong physical activity | 9.36 (1.11) | 9.41 (1.17) | -.04 (-.22 to .12) | 0.59 |

# DISCUSSION

The aim of this self-efficacy theory-based study was to develop and examine the initial content and construct validity and reliability evidence of four new measures to assess mothers' self-regulatory efficacy beliefs and outcome expectations related to transporting their preschool aged child to SPA. Analyzing validity and reliability evidence was an important first step in the self-efficacy theory-based investigation of mothers transporting their children to SPA. Examining the validity and reliability evidence of the new measures helps to reduce the potential for measurement error, which could eventually aid in explaining the occurrence or non-occurrence of transporting children to SPA (Carron et al., 2002; Hinkin, 1995). The following sections review validity and reliability evidence from the the present three-phase study.

## Validity

Evidence for the content and construct validity of the measures was collected in the present study throughout the three phases (Kerlinger & Lee, 1973; Messick, 1989; 2000). Two methods, each, were used to collect evidence for the content validity (i.e., item development through literature review *and* focus group interviews) and construct validity of each measure (i.e., development of conceptual framework *and* multiple methods of item development and revision). Multiple samples and complementary methods were used throughout the study to explore the meaning and consequences of using these measures to make inferences, which contribute to the overall process of their construct validation (cf. Messick, 2000).

In particular, the conceptual self-efficacy theory-based framework, used in this study, provided the necessary standardized construct definitions to facilitate the development and testing of the theoretical concepts (cf. Hinkin, 1995). By narrowing the context of the measures to include only mothers' self-regulatory efficacy to schedule/plan and to overcome barriers, and positive, proximal outcome expectations to transport their children to SPA, the validity of the

measures was increased (cf. Hellsten & Rogers, 2009; Hinkin, 1995). Evidence for strong and clear links between the measures' items and the theoretical domain was collected through the process of conducting a literature review and focus group elicitation, and gathering expert judges' and participants' feedback. Numerous items were developed early in the process to allow for deletion of items based on participant feedback and reliability analyses (cf. Hinkin, 1995).

This is not to say that the measures cannot be improved. Since construct validation is an ongoing process (Cronbach & Meehl, 1955; Messick, 2000), further development of the measures using alternative methodologies is encouraged (e.g., the use of item response theory to assess and identify the best items in relation to the constructs could be used; cf. DeVellis, 2003). Continued judgment and logical analyses (e.g., inspection of items to make critical evaluations and decisions, continued new item development) can be done to determine the content relevance and representativeness of the measures (Messick, 1989). However, the current study obtained some initial validity evidence that was necessary and important in order to permit investigation of other forms of validity in future research (Carron et al., 2002; DeVellis, 2003; Kerlinger & Lee, 1973).

**Reliability**

In the present study, reliability of the measures was investigated through internal consistency and temporal stability analyses in Phase 3 (DeVellis, 2003). In regards to internal consistency, the outcome likelihood and value scales demonstrated good internal consistency in both reliability studies, across two different samples (i.e., $\alpha \geq 0.70$; Nunnally & Bernstein, 1994). Of note, the alpha values were all approximately .80 or higher. Scales with high Cronbach's alpha values, like the ones found for the outcome expectation measures, could be considered for item reduction in future investigations as a way to reduce participant burden while still maintaining acceptable scale internal consistency (DeVellis, 2003). At the same time, content

relevance and representativeness would also need to be considered in such cases (Messick, 1989). Regardless, the findings from the series of studies conducted in Phase 3 illustrated promising evidence for the outcome likelihood and value measures.

In regards to the self-regulatory efficacy measures, self-regulatory efficacy to overcome barriers demonstrated acceptable internal consistency in Phase 3, Study 1, and in Study 2 at time 1. However, at time 2, the internal consistency was somewhat lower at .66. At the same time, it must be acknowledged that the lower alpha value may have resulted from measurement error. Perhaps, the scale was not measuring those barriers that were most challenging to the participants at time 2 since such challenges can change over time. This notion, in addition to acknowledging that interpreting a Cronbach's alpha value is only part of the process in reaching conclusions about the reliability of a measure, suggests that the present measure should continue to be investigated (DeVellis, 2003). Other factors to consider when drawing conclusions about scale reliability include, scale brevity, test-retest reliability, construct representation, and measurement error (DeVellis, 2003).

The self-regulatory efficacy to schedule/plan measure demonstrated acceptable to good reliability in Study 1 and in Study 2 at time 2. However, the reliability in Study 2, time 1, was less than the acceptable level (i.e., $\alpha = .53$; Nunnally & Bernstein, 1994). The low Cronbach's alpha value may be due to the exceptionally high mean responses to each item and the low variability in scores on this measure (see Table 2.14). Specifically, when an item has low variability, it cannot be expected to share much variance with other items on the measure (i.e., to produce a higher Cronbach's alpha value; DeVellis, 2003). Another possible explanation for the lower Cronbach's alpha value at time 1 may have been due to the timing of the assessment in relation to when the SPA started. It may have been that at time 1, some mothers may have just

started transporting their child to SPA and some mothers may have been transporting their child to SPA for a number of weeks already, resulting in lower internal consistency. In contrast, at time 2, all of the mothers had some experience transporting their child to SPA. To examine this possible explanation, future research should attempt to focus on one SPA and track changes in measurement properties over the course of the SPA.

The self-regulatory efficacy to schedule/plan measure also had some unexpected univariate correlations within the overall scale. In particular, one item was not significantly correlated with others, as would be expected. The item "*Prepare child ahead of time*" was not correlated with three other items. Since small to moderate inter-item correlations were expected the lack of a relationship between the item "*Prepare child ahead of time*" and other scheduling/planning items was surprising. This was surprising because the focus group findings underscored the item concept as important to scheduling/planning. However, the wording mothers used to describe the concept of preparing their child for the upcoming SPA may have meant different things to different mothers. This item might present a scheduling/planning strategy that is too specific or may be an unclear item (i.e., mothers may have been unsure about what was meant by "prepare child"). These findings suggest that the wording of some of the self-regulatory efficacy to schedule/plan items may need to be modified slightly. After wording modifications, more research is needed to assess the effect of the modifications on the internal consistency of the self-regulatory efficacy to schedule/plan measure.

Taken together, the internal consistency results illustrated that the self-regulatory efficacy measures tended to be reliable. It would be premature to suggest that either of the self-regulatory efficacy measures used in the present study are inadequate due to single instances of low Cronbach's alpha values. More research is needed before these measures are employed in

research studies in which inferences are to be made about participants. Future research should attempt to recruit a sample of participants more diverse in their experiences transporting their children to SPA, which might be more variable in their efficacy beliefs, in order to continue to examine the internal consistency of these measures. Further examination of the internal consistency of these measures would help clarify whether the low internal consistency revealed in the current study is due to: (1) items representing constructs other than the construct of interest that are producing substantial variation in responses across scale items or (2) the exceptionally high mean responses to each item and the low variability in scores. Such information would also contribute to the ongoing construct validation of these measures.

The findings from the present study (i.e., Phase 3, Study 2) provided additional reliability information in the form of the temporal stability of the measures, across a nine-day study period. The measures of self-regulatory efficacy to overcome barriers ($r$ = .74), outcome likelihood ($r$ = .88), and outcome value ($r$ = .84) exhibited adequate temporal stability overall (i.e., Burlingame et al., 1995). In contrast, self-regulatory efficacy to schedule/plan exhibited less than adequate temporal stability ($r$ = .46).

In regards to self-regulatory efficacy to schedule/plan, the low temporal stability may have been due to measurement unreliability, a ceiling effect, *or* a change in the construct itself, which the measure accurately tracked (DeVellis, 2003). In regards to the ceiling effect, recall that the mean scores for each item were high and lacked variability, which could prohibit high correlations between the measure at times 1 and 2. Alternatively, in line with Bandura's (1997) suggestion that efficacy beliefs are situationally determined and dynamic, the low temporal stability scores for the self-regulatory efficacy to schedule/plan measure may have revealed the dynamic nature of this construct. At this stage in the measurement development process,

delineating a variety of factors that may complicate the measurement of reliability was not the focus, and more research needs to be conducted to assess the temporal stability of all measures in order verify or disprove findings in the current study (DeVellis, 2003).

Further, in regards to changes in individual items over time, the mean scores of three items were statistically different from initial to final assessment (one item each on self-regulatory efficacy to overcome barriers, self-regulatory efficacy to schedule/plan, and outcome likelihood measure). Although the paired *t*-test suggested that mothers altered their responses on these items during the nine-day period, this difference does not seem to be meaningful. For example, on the self-regulatory efficacy to schedule/plan measure, the mean response changed from 98% to 95% for the item of "*I can prepare my child for the SPA ahead of time*". The mean response at both time periods remained within the highly confident range (see Table 2.14 and 2.16 for mean scores for each item), suggesting that the significant change was not meaningful. Taken together, the findings and interpretation of meaningful importance in items that changed over time suggested that the measures of self-regulatory to overcome barriers, outcome likelihood, and outcome value were temporally stable.

**Practical and Methodological Considerations**

According to Bandura (1997), a strong emphasis should be placed on the correspondence of efficacy measures with behavioral outcomes. Therefore, the measures were developed with a specific behavior in mind. For this study, the behavior involved transporting one's child to SPA. In order to accurately respond to the measures, the mothers were required to have a degree of knowledge or experience of the situational demands needed for transporting their child to SPA (Bandura, 1997).

As a result of the specificity of the methodological design, the external validity of this study is limited to a specific population. However, the aim of this study was to develop new

measures and to examine the content and construct validity and reliability evidence of these measures. Although minority, lower socioeconomic, and single parent families may be underrepresented in this study, future research could recruit from more targeted population niches, which include a wider range of mothers from more diverse backgrounds. In this case, researchers would also have to reconsider the use of web-based surveys, which may not be appropriate with these population niches, and the use of recruitment strategies that would effectively sample underrepresented groups.

The mean scores on the theory-based constructs had low variability. The low variability in scores is similar to other research assessing mother's beliefs and attitudes toward their preschool aged children's behavior (i.e., Hinkley, Crawford, Salmon, Okely, & Hesketh, 2008; Jones, Okely, Gregory, & Cliff, 2009; McMinn et al., 2009). In light of previous findings, the current findings suggest these constructs would not be expected to be normally distributed within a population of mothers who have already made the decision to and have registered their child in an SPA. Future research into the mother's beliefs *before* they register their child in SPA may reveal the lower threshold of the self-regulatory efficacy and outcome expectation scores and may result in a more normal distribution of scores.

**Conclusion**

The present self-efficacy theory-based study has presented some initial validity and reliability evidence of newly developed measures to assess mother's self-regulatory efficacy beliefs and outcome expectations. At present, there appears to be some evidence for the content and construct validity, internal consistency, and temporal stability of these measures. To add to the validation of these constructs, it is important to continue to examine the various forms of reliability and validity examined in the present study. It is also important to examine other aspects of validity and, in particular, concurrent and predictive validity. As outlined by Carron et

al. (2002), examinations of concurrent and predictive validity should occur after initial measurement development and testing. The following study examined both of these types of validity.

CHAPTER 3
# STUDY 2

Recent reports have highlighted the role that parents have in promoting physical activity among their preschool aged children (e.g., Canada's Report Card on Physical Activity for Children and Youth, 2007; 2010). Parents, and more specifically mothers, who tend to be the primary caregivers, may play a particularly important role when their children participate in SPA (Grolnick & Slowiaczek, 1994; Jacobs & Eccles, 1992; Lareau, 2000). SPA is planned and directed by adults, and requires the registration of the children to participate (e.g., community-based sports teams; NASPE, 2002). Further, SPA typically requires children to be transported to a location in a community in order to participate (e.g., field, hockey rink). To date, very little research has examined possible predictors of mothers' behaviors that facilitate their preschool aged children's physical activity (Timmons et al., 2007), including transportation to SPA. Furthermore, when conducted, the research has been largely atheortical (e.g., McMinn et al., 2009).

Using self-efficacy theory (Bandura, 1997) as the foundation in Study 1, measures of mothers' self-regulatory efficacy beliefs and outcome expectations to transport their children to SPA were first developed and then the initial reliability (i.e., internal consistency; test-retest) and validity (i.e., content validity) evidence for the measures was examined. Measures developed with reliability and validity in mind are needed for a number of reasons, including to help researchers better understand theoretical relationships between variables, which may eventually help guide the development of interventions (Cronbach & Meehl, 1955; Duda, 1998; Hinkin, 1995). Overall, in Study 1, initial evidence of content validity, internal consistency, and temporal stability, contributing to the construct validation of the measures, was obtained (DeVellis, 2003).

Despite this promising initial evidence, "relying on a single study or form of validity as the primary form of validation and support for future use is uninformed overconfidence for naïve users and gross negligence on the part of knowledgeable users" (Carron et al., 2002, p. 28). Carron et al. (2002) suggested that different forms of validity should be examined to determine if measures accurately assess social cognitive constructs. Although different forms of validity have been explained in slightly different manners in the published research (e.g., Carron et al., 2002; Messick, 1989; 2000), these different forms can be considered as including content, criterion, and construct validity (DeVellis, 2003). Some forms of validity are examined earlier in the measurement development process, whereas others are examined later (Carron et al., 2002). For example, content validity, involving the degree to which the items in a measure are relevant to, and representative of the targeted construct, occurs early in the development of measures (Carron et al., 2002; DeVellis, 2003; Kerlinger & Lee, 1973). Examination of criterion-related validity occurs after content validation, whereas construct validation is an ongoing process involving continued verification of the measures and their underlying theory (Cronbach & Meehl, 1955; Messick, 2000; Nunnally, 1978).

In regards to the present line of research, and building on the findings from Study 1, an important next step was to investigate the initial criterion-related validity of the measures. The focus of criterion-related validity is on the strength of the empirical associations between newly developed measures and criterion measures (Kerlinger & Lee, 1973). Two types of criterion-related validity include concurrent and predictive validity (DeVellis, 2003), which were examined in the present study, and are reviewed in the following sections.

**Concurrent Validity**

Concurrent validity is studied when newly developed measures and criterion measures are administered at the same time (DeVellis, 2003). When exploring concurrent validity, the

*convergence* of new measures with other *similar* criterion measures and their *divergence* with *different* criterion measures can be examined (Brawley, Carron, & Widmeyer, 1987; DeVellis, 2003). Examination of convergence and divergence requires consideration of: (a) which criterion measures are theoretically similar (i.e., convergent) or different (i.e., divergent) and (b) the magnitude of correlation that is sufficient to support or refute hypotheses about measurement convergence or divergence (Brawley et al., 1987).

**Convergent Validity.** A criterion measure should be conceptually similar to, but not redundant with, a new measure when examining convergent validity. Administration of both measures at one point in time, followed by examination of their correlation is needed to determine their convergence. No definitive statistical magnitude exists to determine acceptance or rejection of concurrent validity. However, Carron et al. (2002) provided advice in this regard by suggesting that a new measure is convergent with a criterion measure when they correlate moderately well (e.g., $r = .35$ - $.60$). Alternatively, high correlations between the measures (e.g., $r \geq .75$) suggest redundancy (i.e., measures assess the same construct), whereas low correlations (e.g., $r \leq .20$) suggest that the new measure did not assess what it was designed to assess (Carron et al., 2002).

In regards to self-regulatory efficacy, Study 1 has been the only study to date to employ measures of efficacy beliefs related to mothers transporting their children to SPA. Within the larger physical activity domain, studies have used various measures of self-regulatory efficacy beliefs across different domains of self-regulatory performances needed to engage in the motivated behavior of physical activity, such as overcoming barriers/coping, scheduling/planning, goal setting, and preventing relapse (e.g., Gyurcsik & Brawley, 2001; McAuley & Mihalko, 1998; McAuley, Pena, & Jerome, 2001; Woodgate et al., 2005). Measures

of efficacy beliefs for these different self-regulatory domains have been correlated with each other at levels that illustrate convergent validity (e.g., self-regulatory efficacy to cope and self-regulatory efficacy to schedule/plan, $r$ = .66; Gyurcsik & Brawley, 2001).

Similar findings of convergence would also be expected when examining the associations between self-regulatory efficacy beliefs for the different domains of performances that help mothers transport their children to SPA (i.e., a motivated behavior). In particular, the newly developed measures of self-regulatory efficacy beliefs to schedule/plan and to overcome barriers to transporting children to SPA were expected to illustrate convergent validity. These aspects of self-regulation are conceptually related in that they require self-regulation to produce transportation behaviors. However, they are also distinct (i.e., not redundant) as they capture efficacy beliefs for different self-regulatory performances – scheduling/planning in transportation is distinct from overcoming barriers, such as when a mother is sick and unable to transport her child.

Similar to the expected convergence of the self-regulatory efficacy measures, the likelihood and value of expected outcomes should also illustrate convergence with each other. According to self-efficacy theory (Bandura, 1986), individuals are motivated to perform behaviors when expected outcomes are both highly valued and perceived as being likely to occur. Despite the theoretical contention that outcome likelihood and value are related, but not redundant concepts, no research to date has explicitly examined their convergent validity (Williams et al., 2005). However, evidence in the larger physical activity domain suggests that likelihood and value are indeed convergent. For example, findings from a focus group study revealed that adults with arthritis who were regularly active perceived outcomes (e.g., less pain) as being more likely to occur than those who were insufficiently active (Wilcox et al., 2006).

However, both groups highly valued the outcomes. Further, in a quantitative study, the value of activity-related outcomes was found to be equally high among women with arthritis who had greater versus weaker levels of pain acceptance and physical activity (Gyurcsik, Brawley, Spink, Glazebrook, & Anderson, 2010). However, the likelihood of achieving outcomes was higher in the greater versus weaker pain acceptance groups. Thus, considering contentions in theory and findings in past research, the measures of outcome likelihood and value, developed in Study 1, were expected to demonstrate convergent validity in the present study.

**Divergent Validity.** Measures that are theoretically distinct from each other are also important to consider in the examination of criterion validity. If a new measure has divergent validity, it would be expected to lack a statistically significant positive association, and/or have a negative association, with conceptually distinct measures (Carron et al., 2002). No definitive statistical magnitude exists to determine acceptance or rejection of divergent validity. However, one suggestion is that divergence can be established when the two measures being examined have a low correlation (e.g., $r \leq .20$), no correlation, or a negative correlation (Carron et al., 2002).

In the present study, the newly developed measures of self-regulatory efficacy beliefs were expected to demonstrate divergence with the measures of outcome expectations. According to self-efficacy theory (Bandura, 1997), efficacy beliefs and outcome expectations are conceptually distinct. Expected outcomes *result* from behavioral performances, whereas efficacy beliefs revolve around individuals' beliefs in their skills and abilities to *produce* the behavior (Bandura, 1997). Outcome expectations influence, but do not guarantee, behavioral action. Individuals, who believe the behavior will produce positive outcomes, and value those outcomes, will be motivated to carry out the behavior when they also have efficacy in their capabilities to

do the behavior. In short, outcome expectations and self-efficacy beliefs work together to motivate behavior, but, are different constructs (Bandura, 1997).

Evidence in the larger physical activity domain supports the divergence of measures of self-efficacy and outcome expectations (see Williams et al., 2005 for a review). For example, in a sample of female exercisers, Rodgers and Gauvin (1998) found that the correlations between self-efficacy to adhere to exercise and a composite score of mainly proximal outcome likelihood and value items was low and not statistically significant, demonstrating divergence. Therefore, in the present study, based on theory and past research, the measures of self-efficacy (i.e., self-regulatory efficacy to overcome barriers and to schedule/plan) and outcome expectations (i.e., outcome likelihood and value) were expected to demonstrate divergent validity by having low, non-statistically significant correlations.

**Predictive Validity**

Predictive validity involves examination of the predictive association between the newly developed measures, administered at time 1, and a criterion, administered in the future (i.e., time 2; Cronbach & Meehl, 1995; DeVellis, 2003). The choice of a criterion is straightforward when theory has been used to guide the research process. That is, theory stipulates the predictive relationships between variables (i.e., independent and dependent, criterion variables). Particularly relevant to the present study, self-efficacy theory (Bandura, 1997) hypothesizes that self-efficacy beliefs and outcome expectations may be predictive of transporting one's child to SPA (i.e., a motivated behavior).

According to self-efficacy theory (Bandura, 1997), individuals will engage in a motivated behavior when they perceive valued outcomes are likely to occur from their behavioral performance and when they are efficacious in performing the behavior. However, when it comes to the self-efficacy beliefs and outcome expectations *predicting* motivated behavior, self-efficacy

theory makes three specific contentions (Bandura, 1997). First, self-efficacy beliefs are the central predictors of motivated behaviors (Bandura, 1997). This is because individuals will only engage in a behavior when they perceive they have the capabilities to perform it. For example, although one may expect and value the outcomes from winning a 50-meter freestyle swim race, one will not engage in this behavior unless one is efficacious to regularly schedule/plan and overcome barriers to attending practices, which are necessary to improve one's performance to a level that will win the race. Although the predictive association between efficacy beliefs and transportation to SPA has not been examined, a wealth of research exists to support the theoretical relationships of self-regulatory efficacy beliefs predicting other motivated, physical activity behaviors across a variety of populations (e.g., Gyurcsik & Brawley, 2001; McAuley & Mihalko, 1998; McAuley et al., 2001; Woodgate et al., 2005). In line with this research and theoretical contentions, self-regulatory efficacy to schedule/plan and to overcome barriers were expected to predict mothers' transportation to SPA behaviors in the present study.

The second contention (Bandura, 1997) is that after taking into account the association between efficacy beliefs and behavior, outcome expectations will *not* explain any additional variance when the outcomes are highly contingent on the behavioral performance (i.e., performance determines the outcomes; Bandura, 1997). For example, outcomes, such as getting a mental break from one's regular work day (i.e., the outcome) by engaging in physical activity (i.e., the behavior) are highly contingent on whether one engages in the behavior. In this case, outcome expectations, although still motivating, would become a redundant predictor of behavior.

Third, according to theory (Bandura, 1997), outcome expectations should predict behavior, beyond what can be explained by self-efficacy, when outcomes are not completely

contingent on the quality of behavioral performance. This lack of contingency can occur when factors, not directly tied to performance level, also affect individuals' expected outcomes, or when a minimal level of performance quality is needed, and any further improvements in performance do not change the expected outcomes. For example, the outcome of losing weight is not completely contingent on an individual's weekly physical activity. This outcome can also be influenced by one's food intake. As another example, the outcome of meeting new friends at a group fitness class program, requiring a sign up and occurring over time, would be expected only during the first few class sessions, and future attendance would not contribute additionally to this outcome (i.e., since new participants cannot register versus a drop-in-type of class). In these examples, outcome expectations would contribute to the prediction of behavior (Bandura, 1997).

In regards to the present line of research, the items contained on the outcome likelihood and value measures developed in Study 1 reflected proximal outcomes for the children that the mothers expected from transporting their children to SPA. However, it was unknown whether such outcomes were perceived as being entirely contingent on mothers' behavioral performances of transporting their children to SPA. Thus, no hypotheses about outcome expectations predicting mothers' transportation behavior were advanced.

**Purposes and Hypotheses**

The current study had two primary purposes. The first purpose was to examine the concurrent validity (i.e., convergent and divergent) of the self-regulatory efficacy to overcome barriers, self-regulatory efficacy to schedule/plan, outcome likelihood, and outcome value measures. The second purpose was to examine the predictive validity of these measures in predicting mothers' transportation of their preschool aged children to SPA.

In regards to the first purpose, self-efficacy theory (Bandura, 1997) and findings from previous research (e.g., Gyurcsik & Brawley, 2001; McAuley & Mihalko, 1998; Woodgate et al., 2005) provided the basis for three study hypotheses:

Hypotheses for Study Purpose 1 (Concurrent Validity)

$H_1$: Measures of self-regulatory efficacy to overcome barriers and to schedule/plan would demonstrate convergence by being moderately associated with each another, but not redundant (e.g., $r$ = .35 to .60; Carron et al., 2002).

$H_2$: Outcome likelihood and outcome value measures would demonstrate convergence by being moderately associated with each another, but not redundant (e.g., $r$ = .35 to .60; Carron et al., 2002).

$H_3$: The self-regulatory efficacy measures would demonstrate divergence with the outcome likelihood and value measures by being associated at non-significant, low levels (e.g., $r$'s $\leq$ .20; Carron et al., 2002).

In regards to the second study purpose to examine the predictive validity of the self-regulatory efficacy and outcome expectation measures, one hypothesis was advanced. This hypothesis was based on self-efficacy theory (Bandura, 1997) and findings from past research (e.g., Dawson, Gyurcsik, Culos-Reed, & Brawley, 2001; Ducharme & Brawley, 1995; McAuley et al., 2001; Woodgate et al., 2005):

Hypothesis for Study Purpose 2 (Predictive Validity)

$H_4$: Self-regulatory efficacy to overcome barriers and to schedule/plan would be significant, positive, independent predictors of mothers' transporting their preschool aged children to SPA.

**Secondary Purpose.** A secondary purpose of the study was to investigate whether significant predictors of mothers' transportation to SPA continued to be significant, after controlling for their past transportation behaviors (i.e., mothers' past experiences in transporting their children to SPA). This secondary purpose was advanced because controlling for past behavior is important when investigating ongoing behaviors, such as transporting a child to a regularly scheduled SPA (Weinstein, 2007). Specifically, past behavior can impact efficacy beliefs and outcome expectations, as well as present behavior (Bandura, 1997; cf. Weinstein, 2007). For example, the mastery that individuals gain from regularly performing a behavior can increase their self-efficacy beliefs and the likelihood and value of outcomes they expect from behavioral performances in the future. The impact of past behavior on social cognitions can artificially inflate/overestimate the predictive association between efficacy beliefs and behavior, as well as between outcome expectations and behavior (cf. Weinstein, 2007). Thus, to be careful in the research process by not overestimating the predictive associations between significant predictors of transportation to SPA in the present study, the recommendation made by Weinstein (2007) to first control for past behavior and to then enter the remaining predictors was followed. One advantage to this approach is that if the social cognitive predictors remained significant, then stronger support for their predictive relationship with transportation to SPA would be evidenced (i.e., by not overestimating the association but maintaining significant prediction; Weinstein, 2007).

# METHODS

## Participants

Participants were a volunteer sample of 93 mothers of a preschool aged child (aged 2 – 5 years), who was registered in a SPA over the four-week study period. Table 3.1 contains specific demographics of the participants and their child of focus (i.e., the child being transported to SPA during the study period). The mean age of the participants was 34.88 years (*SD* = 5.04). Participants' family income ranged from less than $25,000 to greater than $100,000, with most reporting an income of $45,000-75,000 (*n* = 29; 32.60%). A majority of the participants were married (*n* = 82) and held Bachelor's or advanced degrees (*n* = 59).

Table 3.1

Demographic Characteristics of the Study Participants ($n$ = 93)

| | *n* (Percentage) | *M* | *SD* |
|---|---|---|---|
| Total number of children in household | 93 (100.00) | 2.04 | 0.67 |
| Age of focus child (years) | 93 (100.00) | 3.88 | 0.91 |
| Age of participant (years) | 91 | 34.88 | 5.04 |
| Gender of focus child | | | |
| Female | 46 (49.50) | | |
| Male | 47 (50.50) | | |
| Family Income | | | |
| <$25,000 | 4 (4.50) | | |
| $25-45,000 | 10 (11.20) | | |
| $45-75,000 | 29 (32.60) | | |
| $75-90,000 | 14 (15.70) | | |
| $90-100,000 | 14 (15.70) | | |
| >$100,000 | 18 (20.30) | | |
| No response | 4 | | |
| Relationship Status | | | |
| Married | 82 (88.20) | | |
| Not married living with a partner | 5 (5.40) | | |
| Have a partner, not living together | 2 (2.20) | | |
| Separated | 2 (2.20) | | |
| Single-never married | 2 (2.20) | | |
| Participants' Education | | | |
| Less than university | 34 (36.50) | | |
| Bachelor's or advanced degree | 59 (63.50) | | |
| Partner's Education | | | |
| Less than university | 44 (48.30) | | |
| Bachelor's or advanced degree | 47 (51.70) | | |
| No response | 2 | | |

**Procedures**

The University Ethics Review Board provided human ethics approval for this prospective online study, prior to participant recruitment (see Appendix A). In an attempt to recruit a diverse sample of participants, three recruitment strategies were used: (1) newsletters (i.e., city community associations, city soccer clubs, city leisure services), (2) life path posters (i.e., posters placed at preschools/day cares, libraries, and health clubs/recreation facilities where mothers would be passing by during their day-to-day activities), and (3) face-to-face contact (i.e., children's skating lessons, swimming lessons, and university day camps). All recruiting announcements explained the study purposes and procedures and included a link to the first online survey (see Appendix H). The purpose of using multiple recruitment strategies was to obtain a diverse sample of participants, who had a range of experiences in transporting their children to SPA. A diverse sample would be more likely to endorse a range of responses for each measure, versus endorsing only one part of the response scale (e.g., all responding on the high end and thus, ceiling out, or vice versa). A range of responses would increase the variability within a sample and contribute to the validity of the measures (Clark & Watson, 1995).

Individuals who were recruited and accessed the first online survey (see Appendix I), began by reading informed consent information. Individuals were informed that by completing the survey, they were consenting to participate. Individuals who then proceeded were required to complete participant inclusion criteria questions. The criteria included: (a) being a mother with a preschool aged child between 2-5 years of age and (b) this child was currently participating in at least one SPA for four or more weeks from the time the mother completed the first survey. SPA was defined for the mothers as "*any physical activity your child has to be registered for that is organized and started by adults (e.g., community organizations/associations, clubs, leisure facilities, etc.)*" (NASPE, 2002*)*. The inclusion criteria ensured participants would be engaged in

the behavioral outcome (i.e., transporting a preschool aged child to SPA) during the duration of the study period (i.e., four weeks). Participants could then provide realistic answers to the survey questions (cf. Bandura, 1997; 2005). Demographic characteristics, such as participants' age, level of education, and total household income, as well as mothers' past experience in transporting their child(ren) to SPA, were then obtained on the web-based survey.

Individuals who met all of the participant inclusion criteria and completed the demographic section continued to the remainder of the survey. Participants were then asked to choose one SPA in which their child would be participating in most often in the next four weeks. Participants were instructed to focus their responses on this one activity when answering the remainder of the survey, which assessed self-regulatory efficacy beliefs to schedule/plan and to overcome barriers and outcome likelihood and value. A focus on only one SPA was required so that mothers would have a specific and delimited set of experiences to call upon/focus on when answering the survey questions (cf. Bandura, 2005). At the end of the first survey, participants were informed that a link to the second survey (see Appendix I) would be emailed in four weeks. The second online survey assessed the total number of days the participant transported her child to SPA during the previous four weeks.

As a result of recruitment, a total of 124 individuals, who met participant inclusion criteria, completed survey 1. Ninety-five individuals completed survey 2. However, two participants on survey 2 were outliers across a number of their responses and were excluded (Tabachnik & Fidell, 2007; see data analysis section for more detail). Therefore, 93 individuals who had full data and no outliers served as the study participants (see Figure 3.1). Independent *t*-tests and chi-square analyses comparing demographic characteristics between study participants ($n = 93$) and those who were excluded ($n = 31$) were conducted. No significant differences

existed between the two groups in the age of the children of focus, $t$ (122) = .72, $p$ > .05 and the participants' age, $t$ (118) = .94, $p$ > .05 (see Table 3.2 for the means). Further, no significant differences were found between the groups on the gender of the children of focus, $\chi^2$ (2) = .01, $p$ > .05, total household income, $\chi^2$ (6) = 7.46, $p$ > .05, participants' education, $\chi^2$ (2) = .72, $p$ > .05, and partners' education, $\chi^2$ (2) = .43, $p$ > .05 (see Table 3.2).

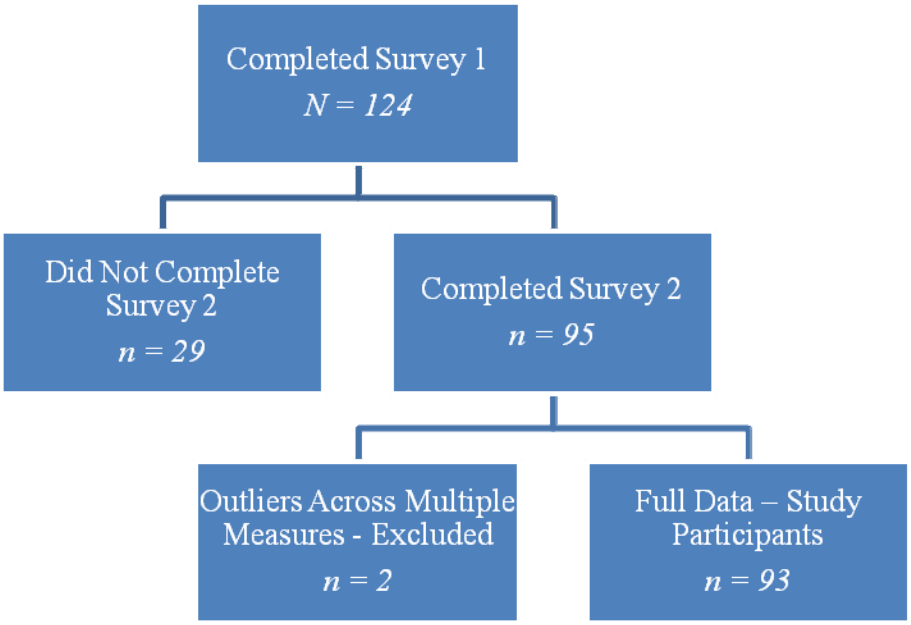


Figure 3.1. Flow chart of individuals who completed at least survey 1.

Table 3.2

Comparisons Between Study Participants ($n$ = 93) and Non-Participants ($n$ = 31)

| Demographics | | Participants | Non-Participants |
|---|---|---|---|
| | | *M* (*SD*) | *M* (*SD*) |
| Childs' Age (years) | | 3.88 (.91) | 3.74 (.99) |
| Participants' Age (years) | | 34.88 (5.04) | 33.86 (4.99) |
| | | Frequency (%) | Frequency (%) |
| Childs' Gender | Female | 46 (37.09) | 15 (12.09) |
| | Male | 47 (37.90) | 16 (12.90) |
| Family Income | | | |
| | Less than $25,000 | 4 (3.33) | 5 (4.16) |
| | $25,000-$44,999 | 10 (8.33) | 4 (3.33) |
| | $45,000-$74,999 | 29 (24.16) | 10 (8.33) |
| | $75,000-$89,999 | 14 (11.66) | 6 (5.00) |
| | $90,000-$99,999 | 14 (11.66) | 1 (0.83) |
| | $100,000 and over | 18 (15.00) | 5 (4.16) |
| Education | | | |
| | Less than university | 34 (27.40) | 14 (11.30) |
| | Bachelor's or advanced degree | 59 (47.60) | 17 (13.70) |
| Partners' Education | | | |
| | Less than university | 44 (37.30) | 15 (12.70) |
| | Bachelor's or advanced degree | 47 (39.80) | 12 (10.20) |

*Note.* No significant between group differences were found, $p$'s > .05

**Measures**

See Appendix I for the measures included on surveys 1 and 2.

**Demographics.** Participant demographics were obtained, such as age, total family income, and education level. Demographics for the child of focus (i.e., child who was being transported to SPA) were also obtained (i.e., age and gender).

**Self-regulatory efficacy to overcome barriers.** A four-item self-regulatory efficacy to overcome barriers measure was used to assess a participant's beliefs in her abilities to transport her child to scheduled SPA in the face of barriers over the next four weeks. The participant was first presented with the statement, "*In the next 4 weeks, I am confident I can take my child to the activity even if…*", followed by the individual barrier items ($N = 4$; *my house is not clean and I am expecting guests; another family member [like my partner or parents] needs me to spend time with them at the same time as the activity; I am sick;* and *my other child(ren) is/are sick*) and a response scale ranging from 0% (*not at all confident)* to 100% (*completely confident)*. The response option of "*not applicable*" (N/A) was also available if the barrier item was not expected to occur and thus, would not be relevant to the participant (≤ 30 participants responded with N/A for each item) (cf. Brawley et al., 1998). For each participant, an overall mean score was computed, based on their responses to the barriers applicable to them. The mean value was used in the analyses.

**Self-regulatory efficacy to schedule/plan.** A five-item self-regulatory efficacy to schedule/plan measure was used to assess a participant's beliefs in her abilities to plan and schedule courses of action needed to transport her child to scheduled SPA over the next four weeks. The participant was presented with the statement, "*In order to take my child to the activity in the next 4 weeks, I am confident I can…*", followed by the scheduling/planning items

(*N* = 5; *schedule my family's other commitments [e.g., holidays]; change my personal physical activity schedule; plan ahead so other activities will not interfere with taking my child to the activity; pack the things my child needs for the activity ahead of time;* and *prepare my child [get dressed, fed, etc.] for the activity ahead of time*) and a response scale ranging from 0% (*not at all confident)* to 100% (*completely confident).* A N/A option was also available for each item (≤ 14 participants responded with N/A for each item). For each participant, an overall mean score was computed, based on their responses to the scheduling/planning task items that were applicable to them. The mean value was used in the analyses.

**Outcome likelihood.** A six-item outcome likelihood measure was used to assess a participant's beliefs in the likelihood that positive, proximal consequences for her child would result from transporting the child to scheduled SPA over the next four weeks. The participant was first presented with the statement, "*Because you will take your child to the activity in the next 4 weeks, how likely is it your child will…"* followed by the items (*N* = 6; *build her/his self-confidence to try new activities; burn off energy; increase her/his self-confidence to do an activity without her/his parents; become more comfortable around children her/his own age; make new friends;* and *develop specific movement skills*) and a response scale ranging from 0 (*not at all likely*) to 10 (*extremely likely*). An overall mean score for each participant was computed and used in the analyses.

Of note, the measure was reduced from the eight items in Study 1, to six items in the present study. The decision to reduce the number of items was based on results from the final phase of Study 1, which illustrated that the measure had "reliability to spare" (DeVellis, 2003, p. 97). In particular, high internal consistency (i.e., $\alpha > .80$, Tabachnik & Fidell, 2007) was evident in Study 1, which suggests items could be deleted (DeVellis, 2003). To identify items for

deletion, the "corrected item-total correlation" and "alpha if item was deleted" output in SPSS (see Appendix J), from Study 1, were examined to identify the most internally consistent items to be used on the scale in the present study. These same items were also used for the outcome value measure. The two items deleted from the Study 1 measures (*develop strong muscles* and *develop a habit for lifelong physical activity participation*) did not affect the internal consistency values for the outcome likelihood and value measures. Deletion of these two items also improved the construct relevance since they were more representative of distal outcome expectations versus proximal (i.e., focus of the measure). The six items retained for use still conceptually capture positive, proximal outcomes mothers consider when deciding to engage in transportation to SPA behavior (*build her/his self-confidence to try new activities; burn off energy; increase her/his self-confidence to do an activity without her/his parents; become more comfortable around children her/his own age; make new friends;* and *develop specific movement skills*).

**Outcome value.** A six-item outcome value measure was used to assess a participant's beliefs in the value placed on positive consequences for her child from transporting her child to the scheduled SPA over the next four weeks. The participant was first presented with the statement, "*How much do you value your child...*" followed by the items ($N = 6$; *build her/his self-confidence to try new activities; burn off energy; increase her/his self-confidence to do an activity without her/his parents; become more comfortable around children her/his own age; make new friends;* and *develop specific movement skills*) and a response scale ranging from *0* (*not at all valued*) to *10* (*highly valued*). An overall mean score for each participant was computed and used in the analyses.

**Transporting child to SPA.** To assess the total number of days a participant transported her child to SPA, the participant was asked to: (a) select all of the weeks in which she

transported her child to the scheduled SPA during the previous four weeks (i.e., last week, two weeks ago, three weeks ago, and four weeks ago) and (b) report the number of days she transported her child to the SPA during each of those weeks. This two-question assessment was adapted from previous research in order to facilitate the provision of an accurate assessment of behavior due to prompting a participant to recall both weekly and daily time frames (Burdette, Whitaker, & Daniels, 2004). For each participant, an overall behavioral frequency was calculated by summing the number of days the participant transported her child to SPA.

**Past experience in transporting child(ren) to SPA.** As recommended by Weinstein (2007), a measure of a participant's past behavioral experiences in transporting her child(ren) was obtained in order to investigate and control for the potential association between past and present behavior. In the present study, each participant was asked, "*How often have you taken your child to structured physical activities in the past 3 months?"* The previous three-month period was assessed to provide a better understanding of how mothers had maintained their behavior over a period of time that could include more than the SPA in which the child had been currently registered (cf. Ouellette & Wood, 1998). Since the mastery that mothers' gain from transporting any of their children to SPA would be expected to impact their social cognitions and behavioral performances in the future (Bandura, 1997), participants were also asked to take into consideration transporting all of their children to SPA. The response scale included 0 (*zero times*), 1 (*less than 5 times*), 2 (*6-11 times*), 3 (*12-20 times*), 4 (*24-30 times*) to 5 (*30 or more times).*

**Data Analyses**

Analyses were conducted using SPSS version 17 (SPSS Inc. Chicago, IL). Missing data within each primary study variable were replaced with the sample mean when a participant did not respond to an entire measure (i.e., $n = 1$ on the self-regulatory efficacy to schedule/plan

measure). Alternatively, missing values were replaced with a participant's mean response on a measure when responses to 1 or more item(s) were missing, but other items were answered (i.e., $n = 3$; one participant each on self-regulatory efficacy to overcome barriers, outcome likelihood, and outcome value measures). Replacing missing data with the sample or participant mean allowed for all of the analyses to proceed, without a reduction in sample size due to listwise deletion in SPSS and did not change the mean values for the overall sample (Tabachnik & Fidell, 2007).

The social cognitive and behavioral variables were then screened for: (1) univariate outliers, using boxplots and standardized scores ($z > 3.29$ or $< -3.29$), (2) normality, using histograms and skewness and kurtosis values, and (3) reliability, using Cronbach's alpha (Tabachnik & Fidell, 2007). Data were first screened for univariate outliers through visual examination of boxplots and calculation of z-scores. Six outliers were identified on at least one of the social cognitive variables. All outliers had a z-score of $< -3.29$ and were corrected by replacing the original score with a score one unit lower than the next lowest score for the sample (Tabachnik & Fidell, 2007). This procedure brought the outliers closer to the center of the distribution, thereby reducing their potential impact. After re-examination of the standardized scores, two outliers remained and, as a result, the participants ($n = 2$) who reported these scores were removed from the analyses (Tabachnik & Fidell, 2007).

Data were then examined for normality via a visual examination of histograms and calculation of skewness and kurtosis values. Examination of the histograms of the social cognitive and behavioral variables indicated that the total number of times participants transported their child to SPA appeared to be positively skewed, whereas self-regulatory efficacy to schedule/plan and outcome value appeared to be negatively skewed. To calculate whether the

data were statistically skewed and kurtotic, standardized skewness and kurtosis values were calculated (Tabachnik & Fidell, 2007). Three variables (i.e., self-regulatory efficacy to schedule/plan, outcome value, and transportation to SPA) had standardized skewness and kurtosis values greater than 2.00, which suggested a potential need for transformation (Tabachnik & Fidell, 2007). To determine if transformation was necessary, Cohen, Cohen, West, & Aiken (2003) recommend that a specific procedure be followed when the primary analysis is a hierarchical multiple regression, as in the present study. That is, Cohen et al. (2003) recommend examination of whether the non-normal distribution of the relevant independent variables impact regression findings – if so, then transformation would be necessary. To make this examination, the non-normal independent variables must first be converted to ranks. Then, two multiple hierarchical regression analyses must be conducted. The first analysis should contain the raw data and the second analysis should contain the ranked data for the non-normal variables. In the present study, the findings from the two regressions were the same. These findings illustrate that transformation was not necessary (Cohen et al., 2003) and, thus, the results that are presented in the next section contain all of the untransformed variables.

The multi-item measures were then examined for reliability (i.e., internal consistency) using Cronbach's alpha values. Given the preliminary nature of the research with these measures, a liberal range of α (i.e., .60-.80) was considered adequate (Nunnally & Bernstein, 1994). The four and five items of the self-regulatory efficacy to overcome barriers and to schedule/plan measures revealed internal consistency levels of $\alpha = 0.65$ and 0.69, respectively. The Cronbach's alphas for outcome likelihood and outcome value measures (6 items each) were 0.76 and 0.66, respectively. All alphas fell within the range set as the criteria for this preliminary research (Nunnally & Bernstein, 1994), therefore all measures were used in the study analyses.

In regards to the primary study analyses, descriptive statistics, including means and standard deviations, were calculated for the primary study variables. Pearson correlations were used to investigate the three study hypotheses relating to the concurrent validity of the measures. Then, two hierarchical multiple regressions were conducted to examine the predictive validity of the measures. The assumptions of multiple regression analyses were checked prior to conducting the hierarchical multiple regressions in order to avoid Type I and II errors. Mahalanobis distance was used to detect the presence of multivariate outliers (Miles & Shevlin, 2001). No data from the participants were identified as being multivariate outliers. Normality residual plots were examined for violations in multivariate assumptions pertaining to multivariate normality, homoscedasticity, and linearity (Tabachnik & Fidell, 2007). The multivariate assumptions were not violated. Two analyses were also used to detect the presence of collinearity (i.e., inspection of variance inflation factors [VIF] and a series of regressions to assess the proportion of variance in each independent variable, which was shared by all other independent variables) (Miles & Shevlin, 2001). There was no demonstrated collinearity. Thus, the regression analyses could proceed.

The first hierarchical multiple regression analysis was conducted to address the primary study hypothesis related to predictive validity. In line with the least is last approach recommended by Cohen et al. (2003), the most theoretically important predictors of transporting one's child to SPA were entered first in the model, followed by predictors hypothesized as being of less importance being entered next. Given Bandura's (2004) argument that beliefs of personal efficacy play a central role in human motivation and action, self-regulatory efficacy beliefs were expected to be the strongest predictors. Thus, in the first step, self-regulatory efficacy beliefs to

schedule/plan and to overcome barriers were entered, followed by outcome likelihood and outcome value in the second step.

A subsequent hierarchical multiple regression analysis was conducted to address the secondary purpose that investigated whether, after controlling for past transportation to SPA behaviors, significant predictors of mothers' transportation to SPA continued to be significant. In this analysis, participants' past experience in transporting their child(ren) to SPA was entered in the first step. After controlling for this behavior, the second step of the regression involved entering the significant predictors from the first regression analysis (i.e., the primary study purpose analysis related to predictive validity). The significance level for all statistical tests was set at $p < .05$.

# RESULTS

The results are presented in two main sections. The first section presents descriptives of the measures and Pearson correlations to investigate concurrent validity. The second section presents the results from the two hierarchical multiple regression analyses.

## Concurrent Validity

**Descriptive information.** Table 3.3 contains the means, standard deviations, actual response range of the participants, as well as skewness and kurtosis of the study variables. The sample means for the self-regulatory efficacy beliefs (i.e., to schedule/plan and to overcome barriers) were above the midpoint of the measurement scale (i.e., 50). Participants were highly confident in their self-regulatory efficacy to overcome barriers and extremely confident in their abilities to schedule/plan. The sample means for the outcome expectation variables (i.e., outcome likelihood and value) were close to the high end of the measurement scale. Participants reported that outcomes were both highly likely and highly valued. Also of note is the low variability on the self-regulatory efficacy to schedule/plan and outcome expectancy measures. In contrast, participants were more variable in their self-regulatory efficacy beliefs to overcome barriers. Participants reported transporting their child to SPA on 3 days during the previous four-week period. Finally, the sample mean for past experience transporting children to SPA was slightly below the midpoint of the response scale, which corresponds to transporting child(ren) approximately 12 times in the last 3 months.

Table 3.3

Descriptives of the Primary Study Variables ($n$ = 93)

| Variable | *M* | *SD* | Response range | Skewness | Kurtosis |
|---|---|---|---|---|---|
| SRE to overcome barriers | 74.84 | 16.77 | 33.00-100.00 | -.49 | -.26 |
| SRE to schedule/plan | 96.44 | 5.83 | 77.00-100.00 | -1.99 | 3.35 |
| Outcome likelihood | 8.97 | .92 | 6.50-10.00 | -.56 | -.58 |
| Outcome value | 9.09 | .87 | 6.33-10.00 | -.95 | .63 |
| Total days transporting child | 2.97 | 2.15 | 0.00-11.00 | 1.19 | 1.86 |
| Past experience in transporting to SPA | 2.49 | 1.54 | 0.00-5.00 | .22 | -.93 |

*Note*. SRE = self-regulatory efficacy. SRE to overcome barriers and to schedule/plan were measured on 0% (*not at all confident*) to 100% (*completely confident*) response scales. Outcome likelihood and value were measured on 1 (*not at all likely/valued*) to 10 (*extremely likely/highly valued*) response scales. Total days transporting child to SPA ranged from 0 to 11. Past experience in transporting children to SPA ranged from 0 (*zero times*) to 5 (*30 or more times).*

**Pearson correlations.** To address the three study hypotheses related to the concurrent validity of the measures, Pearson correlations were calculated (see Table 3.4). Consistent with hypothesis one, the correlation between self-regulatory efficacy to overcome barriers and to schedule/plan, $r$ (93) = .31, $p < .01$, demonstrated convergence, based on the criteria set for this study, by being associated but not redundant (Carron et al., 2002). Consistent with hypothesis two, the correlation between outcome likelihood and outcome value demonstrated convergence by having a moderate, but not redundant association, $r = .61$, $p < .01$ (Carron et al., 2002).

Inconsistent with hypothesis three, the correlations between self-regulatory efficacy to schedule/plan and outcome likelihood and value did not demonstrate divergence based on the criteria set out for this study ($r$'s ranged from .34 to .38, $p$'s < .01). These correlations were similar in value to the associations between self-regulatory efficacy to schedule/plan and overcome barriers measures. The correlation between self-regulatory efficacy to overcome barriers and outcome likelihood also did not demonstrate divergence based on the criteria set out for this study ($r = .22$, $p < .05$). However, the correlation between self-regulatory efficacy to overcome barriers and outcome value was consistent with hypothesis three and demonstrated divergence by being associated at a non-significant and low level (Carron et al., 2002) (see Table 3.4).

Table 3.4

Pearson Bivariate Correlations *(n = 93)*

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. Outcome likelihood | | | | | |
| 2. Outcome value | .61** | | | | |
| 3. SRE to schedule/plan | .38** | .34** | | | |
| 4. SRE to overcome barriers | .22* | .12 | .31** | | |
| 5. Total days transporting child | .23* | .16 | .21* | .22* | |
| 6. Past experience in transporting to SPA | .24* | .11 | .05 | .12 | .18 |

*Note*. SRE = self-regulatory efficacy.
*$p < 0.05$
**$p < 0.01$

**Predictive Validity**

**Primary hierarchical multiple regression to predict transportation to SPA.** A hierarchical multiple regression was conducted to examine whether self-regulatory efficacy beliefs and outcome expectations were significant predictors of mothers' transportation of their children to SPA. The first step of the regression, involving self-regulatory efficacy to overcome barriers and to schedule/plan, significantly predicted the number of days of transportation, $F$ (2, 90) = 3.30, $p < .05$. These two predictors accounted for 5% of the variance in transportation behavior (see Table 3.5 for a summary). However, inspection of the standardized beta values revealed that neither self-regulatory efficacy to overcome barriers, nor self-regulatory efficacy to schedule/plan, significantly and independently predicted transportation behavior (see standardized beta values in Table 3.5). Outcome likelihood and outcome value were then included in step two of the analysis. The overall model was not significant, $F$ (4, 88) = 2.19, $p$ = .08, and the addition of outcome expectations did not explain significantly more variance, $R^2_{change} = .02$, $p > .05$.

**Secondary hierarchical multiple regression to predict transportation to SPA.** Since the overall combination of self-regulatory efficacy to schedule/plan and to overcome barriers was significant in the main regression analysis, they were entered in step two of the analysis, after entry of past transportation behavior. As seen in Table 3.5, in step one, past experience did not significantly predict the number of days the participants transported their children to SPA, $F$ (1, 91) = 2.99, $p$ = .08. The addition of self-regulatory efficacy to overcome barriers and to schedule/plan resulted in a significant model, $F$ (3, 89) = 2.98, $p < .05$, with all three predictors accounting for a significant 6% of the variance in transportation to SPA (see Table 3.5 for a summary). However, similar to the findings from the previous regression analysis, inspection of

the standardized beta values revealed that none of the variables were significant, independent predictors of transportation to SPA (see Table 3.5).

Table 3.5

Hierarchical Multiple Regressions Predicting the Total Number of Days That Participants Transported Children to SPA *(n = 93)*

| Predictor | $R^2$ adjusted | $R^2$ change | *F* overall | $\beta_{standardized}$ (SE) | Semi partial Correlations |
|---|---|---|---|---|---|
| **Regression 1 – Primary Study Purpose** | | | | | |
| **Model 1** | .05* | | 3.30* | | |
| SRE to overcome barriers | | | | .17 (.01) | .16 |
| SRE to schedule/plan | | | | .15 (.04) | .14 |
| **Model 2** | .05 | .02 | 2.19 | | |
| Step 1 | | | | | |
| SRE to overcome barriers | | | | .15 (.01) | .14 |
| SRE to schedule/plan | | | | .09 (.04) | .08 |
| Step 2 | | | | | |
| Outcome likelihood | | | | .15 (.31) | .11 |
| Outcome value | | | | .01 (.32) | .01 |
| **Regression 2 – Secondary Study Purpose** | | | | | |
| **Model 1** | .02 | | 2.99 | | |
| Past experience | | | | .18 (.14) | .18 |
| **Model 2** | .06 | .06 | 2.98* | | |
| Step 1 | | | | | |
| Past experience | | | | .15 (.14) | .15 |
| Step 2 | | | | | |
| SRE to overcome barriers | | | | .15 (.01) | .14 |
| SRE to schedule/plan | | | | .15 (.04) | .14 |

*Note.* SRE = self-regulatory efficacy, SE = Standard Error.

*$p < .05$

# DISCUSSION

The main study purpose was to examine the criterion-related validity evidence of the four measures developed in Study 1, in order to contribute to the ongoing process of their construct validation (Cronbach & Meehl, 1955; Kerlinger & Lee, 1973; Messick, 2000). Two types of criterion-related validity evidence, concurrent (i.e., convergent and divergent) and predictive (DeVellis, 2003), were examined in the present study. A secondary purpose was to examine predictors of mothers' transportation to SPA behaviors, after controlling for past experiences in performing this behavior. A summary of study findings and discussion about the support or non-support of study hypotheses are presented in the following sections.

## Convergent Validity

Based on the criteria set out for the current study, the two self-regulatory efficacy measures reflected related, but relatively independent, aspects of self-regulatory efficacy, which was consistent with hypothesis one. The correlation was not so high as to illustrate redundancy, but at a moderate level suggesting that efficacy in different aspects of self-regulation was being assessed by the measures. This finding was similar to previous research that examined correlations among self-regulatory efficacy measures in the physical activity domain (Gyurcsik & Brawley, 2001) and was in line with theoretical contentions (Bandura, 1997).

Consistent with hypothesis two, the outcome likelihood and outcome value measures also reflected similar, but not redundant, constructs. Despite the difference in magnitude between the correlation between the self-regulatory efficacy measures and the correlation between the outcome expectation measures, both of these findings fell within the criteria for convergence set out for the current study (Carron et al., 2002). The finding for the convergence of outcome likelihood and outcome value was similar to previous research in the larger physical activity domain with a symptomatic population (Wilcox et al., 2006). The study by Wilcox et al. (2006)

demonstrated through a focus group methodology, that although individuals with arthritis valued activity-related outcomes, the likelihood of achieving the outcomes was reported to be higher in those who were active versus insufficiently active (i.e., outcome likelihood and outcome value were not redundant constructs). However, the present study was one of the first to quantitatively investigate the convergent validity of measures of outcome likelihood and value. The findings lend support to the contentions in the physical activity literature (Rodgers & Brawley, 1991) that suggest outcome expectations may be comprised of two related, yet not redundant, aspects.

**Divergent Validity**

Consistent with hypothesis three, the measures used to assess self-regulatory efficacy to overcome barriers and outcome value were conceptually distinct (i.e., low and not statistically significant correlation; Carron et al., 2002). This divergence was in line with self-efficacy theory-based contentions that efficacy beliefs and outcome expectations are conceptually distinct constructs (Bandura, 1997). However, inconsistent with hypothesis three, study results illustrated a lack of divergence, based on the criteria set out for this study, between self-regulatory efficacy to schedule/plan and outcome likelihood and value measures as well as between self-regulatory efficacy to overcome barriers and outcome likelihood measures. The moderate correlations between the measures (i.e., *r*'s ranged from .22 to .38) were more suggestive of convergence, than divergence. Three possible explanations are advanced for these findings.

The first explanation is theoretically-based. In particular, the sample appeared to be practiced in transporting their children to SPA, as evidenced by their past experiences in this behavior (i.e., mothers transported their children approximately 12 times in the prior 3 months). As a result of this experience, their efficacy beliefs should be positively impacted (Bandura, 1997), which may have been illustrated by the sample's high beliefs to overcome barriers (i.e., 75% on a 0-100 scale) and extremely high beliefs to schedule/plan transportation to SPA (i.e.,

95%). As a result of being efficacious to self-regulate both their barriers and scheduling/planning, they should have an accurate idea of their behavioral performance, and, in turn, the likelihood that outcomes could be achieved (cf. Bandura, 1997). This would occur because the outcomes individuals perceive as being likely to occur, particularly in a sample with past experience, are hinged on expected levels of behavioral performance (Bandura, 1997). Thus, in the present study, the higher than expected correlations may have been due to sampling bias because of who volunteered to participate – practiced, efficacious individuals who had a good idea of their levels of behavioral performance and thus, the likelihood of achieving outcomes.

The second explanation is related to the type of sample that volunteered for the study, but is statistical in nature. Potential impacts of the sample being practiced were not only high/strong efficacy beliefs and outcome expectations, but also low variability. It appears that a ceiling affect may have occurred with the self-regulatory efficacy to schedule/plan, outcome likelihood, and outcome value measures. Given the corresponding restricted, truncated range of responses on these measures, their low variability matched each other, potentially resulting in significant correlations. In contrast, the higher variability of the self-regulatory efficacy to overcome barriers measure did not match the low variability of the outcome value measure, contributing to their non-significant correlation.

The third explanation is related to the interpretation of the findings. In particular, the correlation between self-regulatory efficacy to overcome barriers and outcome likelihood was significant at $r = 0.22$. Based on the criterion outlined previously, it was concluded that these two variables did not demonstrate the expected divergence. However, in reality, these variables only shared 5% variance, which could be interpreted as two constructs being divergent with each other. It is recognized that, although based on recommendations, the criteria to establish

divergence in the present study may have been overly conservative, which resulted in non-support of some of the hypotheses. Past research in other domains has used a less conservative criterion which explored whether an expected pattern of correlations was evident (i.e., divergent correlations were less than convergent correlations) (Bull, Eakin, Reeves, & Riley, 2006). In the present study, exploration of this less conservative pattern of correlations would have resulted in one different finding – self-regulatory efficacy to overcome barriers would have been divergent from outcome likelihood – as suggested above by their low shared variance. All of the other convergent and divergent findings would have been interpreted similarly, whether the current criteria was used or whether the pattern of correlation method was used.

These explanations are speculative but plausible. Future research should examine whether divergence is found between the self-regulatory measures and outcome expectation measures, in a more diverse sample. Although the multiple recruitment strategies used in the present study were used to try to obtain a diverse sample, participants ended up being unique in their past experiences of transporting children to SPA. Future research should also examine whether measurement error effects the correlations between the constructs (Osborne & Waters, 2002). For example, less reliable measures, such as measures with lower Cronbach's alpha scores that may contain more measurement error, may attenuate the relationship between the constructs.

Continued investigation of these measures is warranted. Construct validation is an ongoing process (Cronbach & Meehl, 1955; Kerlinger & Lee, 1973; Messick, 2000) and discontinuing the investigation of the measures, based on findings from one study about a lack of expected divergence, would be premature (Carron et al., 2002). Further, other validity and

reliability evidence has been gathered in the present program of research, which supports the continued examination of the measures.

**Predictive Validity**

The two self-regulatory efficacy measures entered in step one of the hierarchical multiple regression analysis predicted mothers' transportation of their children to SPA in the present study. However, neither were significant, independent predictors, as hypothesized. The significant, overall predictive relationship between self-regulatory efficacy beliefs and transportation behavior supports contentions from theory (Bandura, 1997) that individuals will engage in a behavior when they perceive they have the capabilities to perform it. This finding of overall significant prediction by both self-regulatory efficacy beliefs is also consistent with the findings of their convergence in the present study – taken together, mothers' self-regulatory efficacy beliefs may be important predictors of transportation to SPA. Despite the finding of overall significance, consideration must be given to the lack of significant independent prediction by the two self-regulatory efficacy measures. Potential explanations, such as multicollinearity and using the non-normally distributed self-regulatory efficacy to schedule/plan variable, were ruled out in the data screening process of this study.

However, other plausible statistical explanations can be provided. Recall that self-regulatory efficacy to schedule/plan was extremely high with low variability. This ceiling effect may have been due to the forethought that mothers may have given to whether transporting their children to SPA, over the course of its offering, would fit into their schedules prior to registering their children in the SPA. As such, in retrospect, self-regulatory efficacy to schedule/plan may not be expected to predict behavior since scheduling/planning transportation was then not a challenge to the participants. The low variability in this measure may have prevented it from predicting another measure, with higher variability – transportation to SPA (Achen, 1982;

DeVellis, 2003). Similarly, measurement error related to the lower internal consistency (but still acceptable) of the measures may have attenuated the relationships between the variables (Osborne & Waters, 2002). Although measurement error can occur in measures of social cognitive constructs, it is important to consider the effects of measurement error in regression analyses when generalizing to a population is the goal (Osborne & Waters, 2002).

In contrast, the variability in the self-regulatory efficacy to overcome barriers measure more closely matched the variability in the transportation to SPA variable. Review of their standard deviations illustrated that each of these variables deviated by about two points in their measurement scales. Further, self-regulatory efficacy to overcome barriers had the strongest association, as evidenced by its semi-partial correlation, with transportation to SPA. One explanation for the lack of significant independent prediction may be related to the power of the study to obtain a reliable regression model. The sample size for the study was sufficient to detect a medium effect (Green, 1991), however, a larger sample or a sample with more diverse experiences may have resulted in a significant independent predictive association. Since the level of statistical power associated with a study is determined by a combination of many factors, such as sample size, reliability and validity of measures, *and* subject variability (Lipsey, 1990), future research could consider recruiting a sample of participants more diverse in their experiences rather than, or in addition to, increasing the sample size. A less practiced, more diverse sample of participants may be more challenged by barriers which would require self-regulatory efficacy to overcome and thus, contribute to participant variability.

No hypothesis was advanced regarding whether the outcome likelihood and value measures would predict transportation to SPA. Findings revealed that these measures were not significant, independent predictors. There may be at least three explanations for these findings.

First, and similar to the discussion on the lack of prediction by self-regulatory efficacy, the high values and low variability in both the outcome likelihood and value measures did not match the higher variability in transportation to SPA. The participants, being practiced in transporting their children to SPA in the past, may have had an accurate understanding of their expected behavioral performances, which determined their outcome expectations (cf. Bandura, 1997). As such, outcome expectations would not be expected to predict transportation to SPA beyond self-regulatory efficacy beliefs (Bandura, 1997). Future research should test the predictive ability of the outcome expectation measures among less practiced samples.

Second, the lack of significant prediction by the outcome expectancy measures may suggest that the items included on the measurement scales were highly contingent on the mothers' behavioral performance. Recall that self-efficacy theory (Bandura, 1997) posits that outcome expectations will not explain any additional variance when outcomes are highly contingent on the quality of behavioral performance. In the current study, mothers were asked to think only about the outcomes she expected for her child when she specifically transported her child to SPA, not anyone else. Thus, the specific wording of the measure could account for the connection between outcome expectations and behavioral performance because it was built into the outcome likelihood and value measures. More research is needed to determine if this high degree of outcome-behavior contingency also applies to the outcomes that mothers have for themselves related to transporting their child to SPA. For example, would outcome expectations add to the predictive variance in mothers' transportation behaviors if the mothers were asked about outcomes they expected and valued for themselves that resulted from transporting their children to SPA (e.g., getting a break from caregiving)?

Third, it may be that the outcome expectations which were assessed did not capture those that were salient to the present group of participants. Recall that *proximal* outcomes were assessed in the present study. Due to their proximal nature, the outcomes may have already occurred, as evidenced by the high average score and low variability in likelihood. Allowing participants to generate additional outcomes that may be more salient to them at a given time, by including open-ended items on the measure, is an avenue for future investigation on proximal outcome expectations.

Overall, despite the lack of evidence to support the predictive validity of the four social cognitive measures, continued investigation is required. Future research should examine the effect of measurement error related to the lower internal consistency of the measures on the variance accounted for in the regressions (Osborne & Waters, 2002). Future investigation should also delineate if, and under what conditions, the measures may exhibit predictive validity. As previously outlined, the sampling bias of the study sample may have contributed to the lack of significant findings. Including a more diverse and less practiced sample of mothers in such research would contribute necessary information to the construct validation of the measures. If the statistical and theoretical explanations for the lack of significance advanced in this discussion are correct, then the measures may exhibit predictive validity. Alternatively, the forethought that mothers may give prior to registering their children in the SPA about whether they: (a) can overcome expected barriers, (b) can schedule/plan transporting their children to SPA into their lives, and (c) believe valued and likely positive outcomes would result from participation in SPA, may limit the ability of these social cognitions to predict significant variance in mothers' transportation behavior. As such, it may be important to investigate social cognitions at the time of making a decision about registration to determine if mothers who register their children for

SPA exhibit a different social cognitive pattern than mothers who decide not to register their children (Bandura, 2004).

**Secondary Purpose**

The secondary purpose of the study examined significant predictors of transportation to SPA, after controlling for past transportation experiences. Although the overall model was significant, past experiences and self-regulatory efficacy beliefs to overcome barriers and to schedule/plan were not significant, independent predictors. Possible explanations for the lack of predictive associations between self-regulatory efficacy beliefs and transportation to SPA have been proposed earlier in the discussion. However, the finding that past experiences did not predict was somewhat surprising considering research in the larger physical activity domain, which shows a relationship between past and present behavior (e.g., Armitage & Sprigg, 2010; Plotnikoff, Lippke, Courneya, Birkett, & Sigal, 2010).

One plausible explanation for the lack of significant prediction by the past experience measure may be explained by the lack of exact scale correspondence between the variables (Bandura, 1997, 2006). In this study, the dependent variable assessed transportation to SPA of one child over a four week period. In contrast, the past behavior measure assessed transportation to SPA of *all* of the children the mother had taken to SPA over the past three months. Thus, the time period of assessment differed and, also, the number of children the mother was thinking about may have differed. A lower level of scale correspondence between measures may have reduced the association between past behavior and future behavior (Bandura, 1997).

Another plausible explanation for the lack of significant prediction by the past experience measure may be explained by the performance context in which mothers transport their children to SPA. Bandura (1986) and others (e.g., Ouellette & Wood, 1998) suggest that when the

performance context is unstable, behavior is guided by conscious, controlled processes. For this sample of mothers, although they had past experience in transporting their child(ren) to SPA, the context may have varied from their past experiences, which then required conscious, social cognitive processing in order to carry out the behavior. In such cases mothers must employ consciously controlled, adaptive solutions that allow flexibility that can be tailored to current circumstances (cf. Ouellette & Wood, 1998). Future research is needed to determine if other social cognitively controlled processes specified by theory contribute to the prediction of mothers' transportation behavior, such as social influences (cf. Wilson & Spink, 2006).

**Practical and Methodological Considerations**

The main limitation of the present study was the sampling bias of the study sample (despite strategies to attempt to recruit a diverse sample). As previously outlined, the sample was highly efficacious, highly valued and expected outcomes to occur, and varied little in these social cognitions. Such a social cognitive pattern may be consistent with their initial forethought and planning when making decisions about whether to register their children for SPA in the first place. In contrast, those who lack efficacy and do not believe and value the positive outcomes that result from transporting their children to SPA, may be those who do not register their children for SPA. Regardless, the ceiling effect in the present study may have constrained the ability of the measures to provide statistical evidence of divergent and predictive validity. Thus, to increase measurement variability, future research should recruit a more diverse sample, ranging from novice to experienced mothers in transporting children to SPA. For example, based on experiences gained in the present study, one suggested recruitment strategy may be to liaise with organizations within the community that have access to information that could be used to screen mothers who may vary in their experiences in transportation to SPA (e.g., hospitals, medical clinics, breasting feeding groups, community programs). An alternative strategy may be

to assess the social cognitive pattern (i.e., self-regulatory efficacy beliefs; outcome expectations) of mothers who do or do not register their children for SPA. It may be that these social cognitions play an important role in predicting registration.

Although the internal consistency values for the self-regulatory efficacy measures in the present study were acceptable (Nunnally & Bernstein, 1994), their internal consistency could be enhanced in future research. To enhance internal consistency, future research should continue to develop items to examine a wider range of scheduling/planning and other challenges to transporting children to SPA which are more difficult for mothers to overcome. It could be argued that self-regulatory measures with more internal consistency would reduce measurement error and thus, make it plausible for them to significantly predict transportation to SPA. At this point, more research is needed to determine if enhancing the reliability of the measures results in self-regulatory efficacy to schedule/plan and to overcome barriers being significant, independent predictors of mothers' transportation to SPA.

**Conclusion**

The present self-efficacy theory-based study provided supportive concurrent validity evidence for the measures and partially supportive divergent validity evidence. Given that construct validation is an ongoing process (Cronbach & Meehl, 1955; Kerlinger & Lee, 1973; Messick, 2000) and although various forms of reliability and validity evidence for the measures have been collected in the present series of studies, future research should be conducted. The overall contribution of these studies to theory and to the existing literature, as well as strengths, limitations, and a discussion of future research directions are presented in the following general discussion.

CHAPTER 4
# GENERAL DISCUSSION

The overall purpose of this self-efficacy theory-based research program was to design measures of mothers' self-regulatory efficacy to overcome barriers and to schedule/plan as well as outcome expectations (likelihood and value) for transporting their children to SPA and examine the initial validity and reliability evidence for these measures. This program of research started with the basic, but necessary, studies that are needed at the beginning of any ongoing construct validation process (Messick, 1989). The two studies in this program of research examined the initial content, criterion-related, and construct validity and reliability evidence of the measures. A major strength of the research was its self-efficacy theory-based foundation (Bandura, 1997). Using a theory allowed for specific conceptual and operational definitions of the constructs under study, as well as a framework to study their relationships with each other (Brawley, 1993; Hinkin, 1995). All of these aspects were key to the development, modification, and examination of the measures, which provided initial evidence to consider in their construct validation (Messick, 1989).

Table 4.1 contains a summary of the findings, which are discussed in more detail after the table.

Table 4.1

Summary of Study 1 and Study 2

| Study 1 | | | |
|---|---|---|---|
| Phase | Examined | Evidence | Support |
| 1 | Content validity | Theory-based and literature review | √ $SRE_B$, $SRE_{S/P}$, OL, OV |
| | Construct validity | Theory-based multi-method and multi-sample process | √ $SRE_B$, $SRE_{S/P}$, OL, OV |
| 2 | Content validity | Focus group and expert judges' feedback | √ $SRE_B$, $SRE_{S/P}$, OL, OV |
| 3 | Internal consistency | Cronbach's alpha results | √ $SRE_B$ OL, OV, ~ $SRE_{S/P}$ |
| | Temporal stability | Pearson correlations and *t*-tests results | √ $SRE_B$, OL, OV ~ $SRE_{S/P}$ |
| **Study 2** | | | |
| | **Concurrent validity** **Convergent validity** $SRE_B$ – $SRE_{S/P}$ OL – OV | Pearson correlation results | √ $SRE_B$, $SRE_{S/P}$ √ OL, OV |
| | **Divergent validity** SRE – Outcome expectations | Pearson correlation results | √ $SRE_B$, OL X $SRE_B$, OV X $SRE_{S/P}$, OL X $SRE_{S/P}$, OV |
| | **Predictive validity** $SRE_B$ $SRE_{S/P}$ OL OV | HMR results HMR results HMR results HMR results | ~ ~ X X |
| | **Secondary purpose** Past transportation to SPA behavior $SRE_B$ (beyond past behavior) $SRE_{S/P}$ (beyond past behavior) | HMR results HMR results HMR results | X X X |

*Note.* HO = hypothesis, $SRE_B$ = self-regulatory efficacy to overcome barriers, $SRE_{S/P}$ = self-regulatory efficacy to schedule/plan, OL = outcome likelihood, OV = outcome value, and HMR = hierarchical multiple regression. √ = support, ~ = partial support, X = no support.

Evidence collected from Study 1 provided some initially supportive evidence for the content validity and construct validation of the four measures. However, it is important to keep in mind that construct validation is an ongoing process and, thus, although this initial phase of the research was supportive, continued investigation is warranted and will be discussed later in the general discussion. In regards to Study 1 findings, item development, through literature review and focus group interviews, provided initially supportive evidence for the content validity. Further, the development of a conceptual framework and multiple methods of item development and revision were supportive of the initial construct validation of the measures. Through the literature review, focus group elicitation, and collection of expert judges' and participants' feedback, links were established between the measures' items and the theoretical domain. Furthermore, a sufficient number of items were developed early in the process to allow for deletion of items based on participant feedback and reliability analyses (Hinkin, 1995).

In Study 1, the reliability of the measures was also investigated through internal consistency and temporal stability analyses. Outcome likelihood and value measures demonstrated acceptable internal consistency in Phase 3, Study 1 and 2, across two different samples (i.e., $\alpha \geq 0.70$; Nunnally & Bernstein, 1994). Self-regulatory efficacy to overcome barriers demonstrated acceptable internal consistency in Phase 3, Study 1, and in Phase 3, Study 2 at time 1. However, at time 2, the internal consistency was somewhat lower at .66. This notion, in addition to acknowledging that interpreting a Cronbach's alpha value is only part of the process in reaching conclusions about the reliability of a measure suggests that more research is needed to provide further evidence for the validation of the present measures (DeVellis, 2003).

The self-regulatory efficacy to schedule/plan measure demonstrated acceptable ($\alpha \geq 0.70$; Nunnally & Bernstein, 1994) reliability in Phase 3, Study 1 and in Phase 3, Study 2 at time 2.

However, the reliability in Phase 3, Study 2 at time 1, was lower. The lower Cronbach's alpha value may have been due to the timing of the measure in relation to mothers' transportation to SPA (e.g., early versus later in the program) or to the high mean responses to each item, with low variability. When an item has low variability, it cannot be expected to share much variance with other items on the measure (i.e., to produce a higher Cronbach's alpha value; DeVellis, 2003). The self-regulatory efficacy to schedule/plan measure also had some unexpected univariate correlations within the overall scale. Since small to moderate positive inter-item correlations were expected between all scheduling/planning items, the lack of a relationship between the item "*Prepare child ahead of time*" and other scheduling/planning items was surprising. These findings suggest that the wording of some of the self-regulatory efficacy to schedule/plan items may need to be modified. In particular, "*Prepare child ahead of time*" could be modified into two items: "*Ensure my child has had a nap on the day of the activity*" and "*Feed my child in a timely manner on the day of the activity*". Clearly, more research is needed to provide further evidence in regards to this measure and other measures developed in the present research program.

The findings from Study 1 also contributed some initial reliability information in the form of the temporal stability of the measures. The measures of self-regulatory efficacy to overcome barriers, outcome likelihood, and outcome value exhibited adequate temporal stability (Phase 3, Study 2). Self-regulatory efficacy to schedule/plan exhibited less than adequate temporal stability (Phase 3, Study 2). The low temporal stability may have been due to measurement unreliability, a ceiling effect, or a change in the construct itself, which the measure accurately tracked (DeVellis, 2003). At this preliminary stage in the measurement development process, one or more of these factors may have complicated the measurement of temporal

stability reliability. As investigations go forward, one goal would be to reduce the number of possible factors that may be contributing to the measurement of reliability and thereby reduce measurement error (DeVellis, 2003).

Study 2 examined the criterion-related validity (i.e., concurrent and predictive) evidence of the developed measures (see Table 4.1). The findings illustrated that the two self-regulatory efficacy measures, as well as the outcome likelihood and value measures, were related but not redundant constructs (i.e., demonstrated convergence, $r = 0.30 – 0.60$; Carron et al., 2002). The self-regulatory efficacy findings were similar to previous research that examined correlations among self-regulatory efficacy measures as well as outcome expectation research in the physical activity domain (Gyurcsik & Brawley, 2001; Wilcox et al., 2006), and were in line with theoretical contentions (Bandura, 1997).

Evidence for the divergence of the measures was less consistent. Self-regulatory efficacy to overcome barriers was found to be divergent from outcome likelihood based on the criteria set out for Study 2 (i.e., $r < 0.20$; Carron et al., 2002). This divergence was in line with self-efficacy theory-based contentions (Bandura, 1997). However, it was not divergent with outcome value, nor was self-regulatory efficacy to schedule/plan divergent with outcome likelihood and outcome value. The moderate correlations between these measures were more suggestive of convergence. As discussed in Study 2, the high amount of experience the participants had in transporting their children to SPA may have contributed to these unique findings.

In regards to predictive validity, although the two self-regulatory efficacy measures predicted mothers' transportation of their children to SPA, neither were significant, independent predictors, as hypothesized. Potential explanations for these findings, such as multicollinearity and using the non-normally distributed self-regulatory efficacy to schedule/plan variable, were

ruled out in the data screening process of Study 2. However, measurement error and a possible ceiling effect may have contributed to the low predicted variance. Further, although the sample size was sufficient to detect a medium effect (Green, 1991), a larger sample, or a sample with more diverse transportation experiences, may have resulted in a significant independent predictive association, in addition to the present findings of an overall significant association between the two efficacy beliefs and transportation to SPA.

Contributions to the physical activity literature, theory, and design, followed by limitations and future directions of this program of research, are discussed in the following sections to demonstrate how the evidence collected in this program of research contributed to the overall process of construct validation of the measures.

**Contributions to the Physical Activity Literature**

This program of research is the first to focus on mothers' self-regulatory efficacy and outcome expectations in regards to transporting their preschool aged children to SPA. These social cognitions have not received attention in the literature related to preschool children's physical activity participation to date (Timmons et al., 2007). One of the key contributions to the physical activity literature of this program of research was to supply the first validity and reliability evidence for measures that assess mothers' social cognitions related to transporting their children to SPA. This is not to say that a final determination of their construct validity can be made at this time. As previously mentioned, the research conducted was necessary in the beginning stages of the development of measures.

The current program of research adds to the physical activity literature by using self-efficacy theory (Bandura, 1997) as the framework for the development and examination of measures to assess mothers' social cognitions. Using theory provided a framework for examining hypothesized relationships between variables and provided conceptual and operational

definitions for the measurement of variables. A theoretical approach can also be used to focus research on *alterable* social cognitive processes that may impact adherence to motivated behaviors (Brawley, 1993). This is necessary if the eventual goal is to improve behavioral performance.

The present research also contributed to the knowledge base on factors that may help preschool aged children participate in a specific type of physical activity – SPA. Recently there have been calls to conduct such research because children as young as 3 years of age continue to decline in their physical activity participation (Active Healthy Kids Canada, 2010; Torun et al., 1996). Thus, identifying factors that may help to stem this decline is of importance. The present research focused on possible social cognitions of mothers of preschool aged children due to their primary care giving role, including transportation behaviors (Cameron et al., 2005; Grolnick & Slowiaczek, 1994; Lareau, 2000; Thompson, 1999). Although it would have been desirable to *begin* the research by examining the predictive associations between self-regulatory efficacy beliefs and outcome expectations of mothers and their transportation to SPA, this was not possible due to the lack of reliable and valid measures of these social cognitions. Attention to the development and examination of the social cognitive measures was of importance in this research for reasons already mentioned. Although the social cognitions were not found to be independent predictors of transportation to SPA, research on this topic should not be abandoned. The lack of significant prediction may have been due to a number of reasons already discussed, which can be investigated in future research.

**Contributions to Theory**

Self-efficacy theory (Bandura, 1997) guided the conceptualization and measurement of self-regulatory efficacy and outcome expectations within this program of research. Based on contentions in self-efficacy theory (Bandura's 1997, 2006) and recommendations to involve

participants as active agents in the research process (Sherif & Sherif, 1969), participants' words were used in the items, which added to the ecological meaning and relevancy of the measures' scores. Overall, the evidence collected to examine the construct validation of the measures in this program of research contributed to the initial stages of establishing the meaning of the measures, to beginning to justify the use of the scores from the measures, and to examining the theory behind the measures (Clark & Watson, 1995; Messick, 2000; Kerlinger & Lee, 1973).

Although numerous studies have employed self-efficacy theory to examine individuals' participation in their own physical activity (e.g., McAuley & Blissmer, 2000; Sallis & Owen, 1999), this program of research was the first to focus on mothers' self-regulatory efficacy and outcome expectations to facilitate the SPA participation of their children. Understanding how these social cognitive constructs operated in this domain of motivated behavior had not been done to date. Although the predictive findings did not support Bandura's (1997) contentions of their associations with behavior, continued research is warranted to better determine the consistency of the predictive findings from this research program, particularly given that a large evidence base exists for the associations between efficacy beliefs, outcome expectations, and individuals' own participation in motivated physical activity behaviors (e.g., Dishman et al., 2009: Gyurcsik et al., 2009; Rodgers & Gauvin, 1998; Wojcicki et al., 2009).

**Contributions to Design**

This research program made two contributions to the design of studies exploring factors that may influence children's SPA participation. First, throughout this program of research, several different methodologies were used to explore the self-regulatory efficacy and outcome expectation constructs, such as a literature review, focus group discussions, expert judges' feedback, and pilot testing. While these methods may have limitations (e.g., literature reviews: the complete reliance on previously published research; focus group discussions: responses of

each participant are not independent because they may be influenced by the group; expert judges' feedback: the expert judges' cannot be said to be representative of all "experts"; pilot testing: potential for inaccurate assumptions on the basis of a small number of pilot data), the replication of the findings using multiple methods provides converging validity evidence to support the measures (Messick, 1989). Thus, the overall design of this program of research helped to ensure that limitations related to specific methodologies did not adversely affect the overall validation of the measures (Hinkin, 1995; Messick, 1989).

Second, built into the design of the studies, participants were screened to ensure they would be engaged in the behavior during the duration of the study and could provide experienced-based, realistic answers to the survey questions (Bandura, 2006). According to Bandura (1997), participants need an experiential basis from which they can respond to the study measures. Thus, to ensure that mothers would base their responses to all measures on their own experience, only mothers with children participating in SPA for the next 4 weeks or more were allowed to complete the measures. One unanticipated implication of this inclusion criterion was that highly experienced individuals ended up being the majority of the participants in the research. Thus, to balance the recommendations by Bandura (2006) with the need to recruit a more diverse sample, it might be beneficial to target recruiting efforts at mothers with all levels of experience, from new mothers transporting their children for the first times to more experienced samples.

**Limitations and Future Directions**

While this research contributed to the existing research evidence, theory, and design, some limitations existed, which can provide avenues for future research. The possible ceiling effects and low variability of the self-regulatory efficacy and outcome expectation measures may have limited their abilities to vary, as hypothesized, with each other, as well as with

transportation to SPA. In retrospect, the ceiling effect should not have been entirely surprising considering these constructs may not be expected to be normally distributed within a population of mothers who had already made the decision to and had registered their children in SPA and, who were experienced.

To address this limitation, several research directions are recommended. Future research should examine mothers' self-regulatory efficacy and outcome expectations *before* they register their children in SPA, which may reveal more variability in these social cognitions. It may be that those who are lower in these social cognitions do not register their children. Identifying which social cognitions contribute to the decision to register is recommended to identify if "successful" mothers differ from "unsuccessful" mothers (cf. Bandura, 2004). Perhaps mothers who do not register their children in SPA (i.e., "unsuccessful") do not have the efficacy beliefs to transport their child on a regular basis. Future researchers should also consider sampling mothers with a more diverse range of experiences in transporting their children to SPA. This type of research would require targeted sampling to attract mothers who are new to transporting their children to SPA (i.e., novices), as well as mothers who have taken many children, many times to SPA (i.e., experienced). A reasonable question to ask in this type of research is whether mothers who are experienced or novice differ in their appraisal of their self-regulatory efficacy beliefs and outcome expectations.

A second limitation in this research was the participants tended to be married and from at least the middle class. Although minority, lower socioeconomic, and single parent families may have been underrepresented, future research could benefit from recruiting from more diverse population niches and should also consider using different modes of data collection and recruitment. For example, the use of web-based surveys may not be appropriate for investigators

seeking mothers in a lower socioeconomic bracket, whereas using interviews to collect data may be more appropriate. This research should take into account that measures completed in print form may have substantially different properties when the items and responses are presented orally (DeVellis, 2003). Thus, research is needed to determine the generalizability of the measures, which were developed in this research, across different population niches and administration modes (DeVellis, 2003).

The low overall variance explained by the hierarchical multiple regressions in Study 2 could be attributed, in part, to the age of the children upon which the mothers were asked to focus. Recall that the participants were transporting their children to SPA one day per week. However, as children get older and begin participating in multiple SPAs, in addition to other structured activities (e.g., music lessons, educational tutoring) which occur more than once per week in total, mothers may face new challenges. According to self-efficacy theory (Bandura, 1997), self-regulatory efficacy beliefs become critical motivators of behaviors in the face of new, difficult challenges. Thus, future research is needed to understand mothers' efficacy beliefs and outcome expectations amidst the mixed challenges as their children get older and participate in more activities.

Within the current research program, only self-regulatory efficacy to overcome barriers and to schedule/plan were assessed. Perhaps self-regulatory efficacy beliefs for other domains of performances are also important in motivating mothers to transport their children to SPA. Future research that examines self-regulatory efficacy for other domains, such as to concurrently self-manage competing goals (see Jung & Brawley, 2010), may shed light on the broader process of self-regulation in regards to transportation to SPA (Cervone, Mor, Orom, Shadel, & Scott, 2004). This may clarify whether the current measures of self-regulatory efficacy beliefs are sufficiently

representative of the beliefs in the self-regulatory abilities of mothers that are important in achieving regular transportation behavior, or if other conceptually representative self-regulatory efficacy measures are also needed (e.g., monitoring, goal setting, relapse prevention, concurrent self-management of competing goals).

Another possible explanation for the low variability in the measure scores, and thus, the low predicted variance, may be related to what mothers consider a *failure* related to transporting their children to SPA. Although successes raise efficacy and failure lowers it, once a strong sense of efficacy is developed, a failure may not have much impact (Bandura, 1986). Thus, mothers who developed a high sense of efficacy may experience a periodic failure, but continue to see themselves as capable of scheduling/planning and overcoming challenges to transporting their children to SPA. These mothers may not consider missing a day transporting their children to SPA as a failure. More research is needed to answer the question, what would mothers consider a *failure* related to transporting their children to SPA?

It would be remiss not to draw attention to some potential concern that may revolve around the construct representativeness of the four and five item self-regulatory efficacy to overcome barriers and to schedule/plan measures. Recall that the construct validation process of the measures began with theory, a literature review, and participants as active agents, which resulted in the identification of a large number of items for potential use on the measures. The items were then reduced throughout the research process, ending with four and five item measures.

Although the procedures employed in this research were justified, and attempted to balance the maintenance of construct representativeness with statistical, informed decision-making, it is also important to keep in mind that the current research is the first step in

attempting to measure these constructs. Perhaps the four and five items capture the scheduling/planning and barrier challenges that are most common across an experienced sample of mothers or perhaps additional/other items may better reflect the constructs. The challenge in developing measures of self-regulatory efficacy is that items that capture difficulties to self-regulation should be captured (Bandura, 1986) and such difficulties may vary across samples (Brawley et al., 1998). In the future, one potential strategy to capture the constructs of efficacy beliefs to schedule/plan and to overcome barriers may be to include the four and five items developed in the present research program, as well as including opportunities for open-ended items which would allow participants to identify other personally challenging items. Another future direction would be to investigate whether participants endorse the four and five items on the existing measures as being challenging to them. Over time, improved construct representation may result. Overall, in summary, it is recognized that the construct representativeness of the measures should continue to be examined in order to continue the ongoing process of their construct validation (Messick, 2000).

**Conclusion**

This was the first research to develop and examine the initial validity and reliability evidence of self-efficacy theory-based (Bandura, 1997) measures of self-regulatory efficacy and outcome expectations related to mothers' transporting their preschool-aged children to SPA. The research was important as it addressed calls to identify factors that may be responsible for physical activity participation in preschool aged children (Active Healthy Kids Canada, 2010). A necessary starting point was to develop and examine the initial reliability and validity evidence of the social cognitive constructs under study. It is important to keep in mind that some instances occurred where some measures demonstrated weaker reliability, such as the lower temporal stability of self-regulatory efficacy to schedule/plan in Study 1, and validity, such as the lack of

independent prediction of transportation to SPA by the self-regulatory efficacy beliefs and outcome expectations. At the same time, other instances occurred where these same measures, as well as the other measures, had supportive reliability and validity evidence. These types of supportive and nonsupportive evidence must be carefully considered in the process of construct validation. Clearly, one to two studies are insufficient to make conclusive judgments about the entirety of the reliability and validity evidence of the self-regulatory and outcome expectancy measures developed in this research. Future research is needed before more conclusive judgments can be made. To do so, a number of future directions could be followed, as previously outlined, such as recruiting a more diverse sample and/or examining these social cognitions prior to registering children for SPA. Collecting further reliability and validity evidence of these measures to compare it with the evidence from the present studies would also contribute to the ongoing construct validation of these measures. Eventually, measures of the social cognitions under study in the present research program might be useful in the identification of self-regulatory and outcome expectancy influences on transportation to SPA and subsequent interventions to change them in order to help mothers adhere to transportation behaviors as a way to facilitate their children's involvement in SPA.

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Appendix A. Ethics Approval

UNIVERSITY OF SASKATCHEWAN

Behavioural Research Ethics Board (Beh-REB)

## *Certificate of Approval*

| PRINCIPAL INVESTIGATOR | DEPARTMENT | BEH# |
|---|---|---|
| Nancy Gyurcsik | Kinesiology | 08-104 |

INSTITUTION(S) WHERE RESEARCH WILL BE CONDUCTED
University of Saskatchewan
Saskatoon SK

SUB-INVESTIGATOR(S)
Lawrence Brawley, Kevin Spink

STUDENT RESEARCHERS
Candace Bloomquist

SPONSOR
UNFUNDED

TITLE
Parental Social Cognitions to Facilitate Structured Physical Activity Opportunities for Preschool Children

| ORIGINAL REVIEW DATE | APPROVAL ON | APPROVAL OF: | EXPIRY DATE |
|---|---|---|---|
| 19-Apr-2008 | 12-May-2008 | Ethics Application<br>Consent Protocol | 11-May-2009 |

Full Board Meeting ☐ Date of Full Board Meeting:

Delegated Review ☒

**CERTIFICATION**
The University of Saskatchewan Behavioural Research Ethics Board has reviewed the above-named research project. The proposal was found to be acceptable on ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this research project, and for ensuring that the authorized research is carried out according to the conditions outlined in the original protocol submitted for ethics review. This Certificate of Approval is valid for the above time period provided there is no change in experimental protocol or consent process or documents.

Any significant changes to your proposed method, or your consent and recruitment procedures should be reported to the Chair for Research Ethics Board consideration in advance of its implementation.

**ONGOING REVIEW REQUIREMENTS**
In order to receive annual renewal, a status report must be submitted to the REB Chair for Board consideration within one month of the current expiry date each year the study remains open, and upon study completion. Please refer to the following website for further instructions: *http://www.usask.ca/research/ethics_review/*

[redacted]

University of Saskatchewan
Behavioural Research Ethics Board

Please send all correspondence to:

Ethics Office
University of Saskatchewan
Room 302 Kirk Hall, 117 Science Place
Saskatoon SK S7N 5C8
Telephone: (306) 966-2975 Fax: (306) 966-2069

UNIVERSITY OF SASKATCHEWAN

Behavioural Research Ethics Board (Beh-REB)

# Certificate of Re-Approval

| PRINCIPAL INVESTIGATOR | DEPARTMENT | Beh # |
|---|---|---|
| Nancy Gyurcsik | Kinesiology | 08-104 |

INSTITUTION (S) WHERE RESEARCH WILL BE CARRIED OUT

University of Saskatchewan
Saskatoon SK

SUB-INVESTIGATOR(S)

Lawrence Brawley, Kevin Spink

STUDENT RESEARCHER(S)

Candace Bloomquist

SPONSORING AGENCIES

UNFUNDED

TITLE:

Parental Social Cognitions to Facilitate Structured Physical Activity Opportunities for Preschool Children

| RE-APPROVED ON | EXPIRY DATE |
|---|---|
| 13-Apr-2009 | 12-Apr-2010 |

Full Board Meeting ☐

Delegated Review ☑

**CERTIFICATION**

The University of Saskatchewan Behavioural Research Ethics Board has reviewed the above-named research project. The proposal was found to be acceptable on ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this research project, and for ensuring that the authorized research is carried out according to the conditions outlined in the original protocol submitted for ethics review. This Certificate of Approval is valid for the above time period provided there is no change in experimental protocol or consent process or documents.

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**ONGOING REVIEW REQUIREMENTS**

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[redacted]

John Rigby, Chair
University of Saskatchewan
Behavioural Research Ethics Board

Please send all correspondence to:

Research Ethics Office
University of Saskatchewan
Box 5000 RPO University
1607-110 Gymnasium Plac
Saskatoon SK Canada S7N 4J8

UNIVERSITY OF SASKATCHEWAN

Behavioural Research Ethics Board (Beh-REB)

## *Certificate of Approval Study Amendment*

| PRINCIPAL INVESTIGATOR | DEPARTMENT | Beh # |
|---|---|---|
| Nancy Gyurcsik | Kinesiology | 08-104 |

INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT
University of Saskatchewan
Saskatoon SK

SUB-INVESTIGATOR(S)
Lawrence Brawley, Kevin Spink

STUDENT RESEARCHER(S)
Candace Bloomquist

SPONSORING AGENCIES
UNFUNDED

TITLE
Parental Social Cognitions to Facilitate Structured Physical Activity Opportunities for Preschool Children

| APPROVAL OF | APPROVED ON | CURRENT EXPIRY DATE |
|---|---|---|
| Revise completion date (Oct. 30, 2009)<br>Revision to Phase II of the study<br>Revised recruitment protocol<br>Revised consent form<br>Final version of survey | 16-Jun-2009 | 12-Apr-2010 |

Full Board Meeting ☐ Date of Full Board Meeting:

Delegated Review ☒

**CERTIFICATION**
The University of Saskatchewan Behavioural Research Ethics Board has reviewed the above-named research project. The proposal was found to be acceptable on ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this research project, and for ensuring that the authorized research is carried out according to the conditions outlined in the original protocol submitted for ethics review. This Certificate of Approval is valid for the above time period provided there is no change in experimental protocol or consent process or documents.

Any significant changes to your proposed method, or your consent and recruitment procedures should be reported to the Chair for Research Ethics Board consideration in advance of its implementation.

**ONGOING REVIEW REQUIREMENTS**
In order to receive annual renewal, a status report must be submitted to the REB Chair for Board consideration within one month of the current expiry date each year the study remains open, and upon study completion. Please refer to the following website for further instructions: *http://www.usask.ca/research/ethics_review/*

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University of Saskatchewan
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Saskatoon SK S7N 4J8

UNIVERSITY OF SASKATCHEWAN

Behavioural Research Ethics Board (Beh-REB)

## *Certificate of Approval*
## *Study Amendment*

| PRINCIPAL INVESTIGATOR | DEPARTMENT | Beh # |
|---|---|---|
| Nancy Gyurcsik | Kinesiology | 08-104 |

INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT
University of Saskatchewan

SUB-INVESTIGATOR(S)
Lawrence Brawley, Kevin Spink

STUDENT RESEARCHER(S)
Candace Bloomquist

SPONSORING AGENCIES
UNFUNDED

TITLE
Parental Social Cognitions to Facilitate Structured Physical Activity Opportunities for Preschool Children

| APPROVAL OF | APPROVED ON | CURRENT EXPIRY DATE |
|---|---|---|
| Revised incentives for participants | 07-Jul-2009 | 12-Apr-2010 |

Full Board Meeting ☐ Date of Full Board Meeting:

Delegated Review ☒

**CERTIFICATION**

The University of Saskatchewan Behavioural Research Ethics Board has reviewed the above-named research project. The proposal was found to be acceptable on ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this research project, and for ensuring that the authorized research is carried out according to the conditions outlined in the original protocol submitted for ethics review. This Certificate of Approval is valid for the above time period provided there is no change in experimental protocol or consent process or documents.

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**ONGOING REVIEW REQUIREMENTS**

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[redacted]

John Rigby, Chair
University of Saskatchewan
Behavioural Research Ethics Board

Appendix B. Study 1 Literature Review Sources

| | Authors | Date | Title | Type of Source |
|---|---|---|---|---|
| 1 | Biddle & Goudas | 1996 | Analysis of children's physical activity and its association with adult encouragement and social cognitive variables | Academic Article |
| 2 | Bjorklund & Brown | 1998 | Physical play and cognitive development: integrating activity, cognition, and education | Academic Article |
| 3 | Brustad, R.J. | 1993 | Who will go out and play? Parental and psychological influences on children's attraction to physical activity | Academic Article |
| 4 | Burdette & Whitaker | 2005 | Resurrecting Free Play in Young Children: Looking beyond fitness and fatness to attention, affiliation, and affect | Academic Article |
| 5 | Burdette, Whitaker, & Daniels | 2004 | Parental Report of Outdoor Playtime as a Measure of Physical Activity in Preschool-aged Children | Academic Article |
| 6 | Caprara, Barbaranelli, Borgogni, Petitta, & Rubinacci | 2003 | Teachers', school staff's and parents' efficacy beliefs as determinants of attitudes toward school | Academic Article |
| 7 | Dempsey, Kimiecik, & Horn | 1993 | Parental influences on children's moderate to vigorous physical activity participation: An expectancy-value approach | Academic Article |

| | Authors | Date | Title | Type of Source |
|---|---|---|---|---|
| 8 | Dzewaltowski et al. | 2007 | Measurement of self-efficacy and proxy efficacy for middle school youth physical activity | Academic Article |
| 9 | Eccles Parsons, Adler, & Kaczala | 1982 | Socialization of Achievement Attitudes and Beliefs: Parental Influences | Academic Article |
| 10 | Heath, Coleman, Lensegrav, & Fallon | 2006 | Using momentary time sampling to estimate minutes of physical activity in physical education: Validation of scores for the system for observing fitness instruction time | Academic Article |
| 11 | Kopp, C.B. | 1982 | Antecedents of Self-regulation: A developmental perspective | Academic Article |
| 12 | Pate, Pfeiffer, Trost, Ziegler, & Dowda | 2004 | Physical Activity among children attending preschool | Academic Article |
| 13 | Pelligrini, Horvat, & Huberty | 1998 | The relative cost of children's physical play | Academic Article |
| 14 | Scott & Panksepp | 2003 | Rough and Tumble Play in Human Children | Academic Article |
| 15 | Shields, C. | 2006 | Overweight & Obesity among children and youth | Academic Article |
| 16 | Shields & Brawley | 2006 | Preferring proxy-agency: Impact on self-efficacy for exercise | Academic Article |
| 17 | Sothern, M.S. | 2004 | Obesity prevention in children: physical activity and nutrition | Academic Article |

| | Authors | Date | Title | Type of Source |
|---|---|---|---|---|
| 18 | Vandell, Pierce, & Dadisman | 2005 | Out-of-school settings as developmental context for children and youth | Academic Article |
| 19 | Welk, Corbin, & Dale | 2000 | Measurement issues in the assessment of physical activity in children | Academic Article |
| 20 | Eccles, Jacquelynne | 1992 | School and Family Effects on the Ontogeny of Children's Interests, Self-perceptions, and Activity Choices | Review Article |
| 21 | Lotan, Merrick, & Carmeli | 2004 | Physical activity in adolescence. A review with clinical suggestions | Review Article |
| 22 | Pelligrini & Smith | 1998 | Physical Activity Play: The Nature and Function of a Neglected Aspect of Play | Review Article |
| 23 | Sirard & Pate | 2001 | Physical Activity Assessment in Children and Adolescents | Review Article |
| 24 | Tammelin, T. | 2005 | A review of longitudinal studies on youth predictors of adulthood physical activity | Review Article |
| 25 | Timmons, Naylor, & Pfeiffer | 2007 | Physical activity for preschool children- how much and how? | Review Article |

| | Authors | Date | Title | Type of Source |
|---|---|---|---|---|
| 26 | Canadian Institute of Child Health | | Moving and Growing Series (ages 0-6) | Report |
| 27 | Canadian Fitness and Lifestyle Research Institute (CFLRI) | 2008 | Canadian Report Card on Physical Activity for Children and Youth 2008: It's time to unplug our kids | Report |
| 28 | CFLRI | 2007 | Canada's Report Card on Physical Activity for Children & Youth 2007: Older but not wiser Canada's future at risk | Report |
| 29 | National Association for Sport and Physical Education | 2002 | Active Start: A Statement of Physical Activity Guidelines for Children Birth to Five Years | Report |

| | Authors | Date | Title | Type of Source |
|---|---|---|---|---|
| 30 | National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention | 1997 | Guidelines for School and Community Programs to Promote Lifelong Physical Activity Among Young People | Report |
| 31 | University of Connecticut: Cooperative Extension System | 2004 | All Children Considered | Newsletter |
| 32 | Alwin, D. | 2001 | Parental values, beliefs, and behavior: A review and promulga for research into the new century | Book Chapter from the book Children at the Millenium: Where have we come from, where are we going? (Owens & Hofferth, 2001) |
| 33 | Healy, J.M. | 2003 | Cybertots: Technology and the Preschool Child | Book Chapter from the book All Work and No Play: How Educational Reforms are Harming Our Preschoolers (Olfman, S., 2003) |
| 34 | Schneewind, K.A. | 1997 | Impact of Family Processes on Control Beliefs | Book Chapter from Self-efficacy in Changing Societies (Bandura, A. 1997) |

| | Authors | Date | Title | Type of Source |
|---|---|---|---|---|
| 35 | de Lench, B. | 2006 | Home Team Advantage: The critical role of mothers in youth sports | Book |
| 36 | Elkind, D. | 2007 | The Power of Play: How Spontaneous, Imaginative Activities Lead to Happier, Healthier Children | Book |
| 37 | Elkind, D. | 1987 | Miseducation: Preschoolers at Risk | Book |
| 38 | Elkind, D. | 1988 | The Hurried Child: Growing up too fast too soon | Book |
| 39 | Garvey, C. | 1977 | Play | Book |
| 40 | Laumann, S. | 2006 | Child's Play: Rediscovering the Joy of Play in Our Families and Communities | Book |
| 41 | Staniford, D. | 1982 | Natural Movement for Children: Guidelines for Parents and Teachers on Play and Physical Activity | Book |
| 42 | Stricker, P.R. | 2006 | Sports success RX! : your child's prescription for the best experience : how to maximize potential and minimize pressure | Book |
| 43 | Goodnow, J. | 2006 | Sources, effects and possible changes in parenting skills: comment on Belsky, Grusec, and Sanders and Morawska | Encyclopedia Article |
| 44 | Grusec, Goodnow, & Kuczynski | 2000 | New Directions in Analyses of Parenting Contributions to Children's Acquisition of Values | Encyclopedia Article |

| | Authors | Date | Title | Type of Source |
|---|---|---|---|---|
| 45 | Heckman, James | 2004 | Invest in the Very Young | Encyclopedia Article |
| 46 | Reilly, J.J. | 2006 | Early Prevention of Obesity | Encyclopedia Article |
| 47 | Canadian Health Reference Guide | 2007 | Children Should Do as Their Parents Say, Not as they Do | Website (http://www.chrgonline.com/news_detail.asp?ID=66735) |
| 48 | Canadian Medical Association | 2007 | Child Health: Our Challenge (Canada's Child Health and Youth Charter October 2007) | Website (http://www.ourchildren.ca/index.htm) |
| 49 | CPS Advisory Committee on Healthy Active Living for Children and Youth | 2002 | Healthy active living for children and youth | Website (http://www.caringforkids.cps.ca/healthy/healthyactive.htm) |
| 50 | The Centre of Excellence for Early Childhood Development | 2007 | Encyclopedia on early childhood development | Website (http://www.child-encyclopedia.com/en-ca/home.html) |
| 51 | Halton Active Living Network | 2008 | Active Minds Active Bodies (various ages) | Website (www.region.halton.on.ca/health/Resources/resource.cfm?ID=154) |

| | Authors | Date | Title | Type of Source |
|---|---|---|---|---|
| 52 | Healthy Active Living for Children and Youth | 2006 | Canadian Pediatric Society | Website (http://www.cps.ca/English/HealthCentres/HAL/Index.htm) |
| 53 | Kellogg's, National Association for Sport & Physical Ed., & President's Council on Physical Fitness and Sports | 2008 | Kids in Action (ages 0-5) | Website (http://fitness.gov/funfit/kidsinaction.html) |
| 54 | Laumann, S. | 2006 | Child's Play | Website (http://www.silkensactivekids.ca/content/Home.asp) |
| 55 | LeapBC | 2008 | Leap BC is a new initiative for families and early learning practitioners, focusing on the importance of literacy, healthy eating, physical development of children birth-5 years. | Website (http://www.2010legaciesnow.com/leap_bc/) |
| 56 | Long-Term Athlete Development | 2007 | Canada Sports Centres | Website (http://www.ltad.ca/content/home.asp) |

| | Authors | Date | Title | Type of Source |
|---|---|---|---|---|
| 57 | National Association for the Education of Young Children | 2007 | Promoting excellence in early childhood education | Website (http://www.naeyc.org/) |
| 58 | New Horizon's For Learning | 2002 | Early Childhood/Parenting | Website (http://www.newhorizons.org/lifelong/childhood/front_childhood.htm) |
| 59 | The Factbook: Eye-opening Memos on Everything Family | 2007 | Collection of research on family | Website (http://www.pobronson.com/factbook/pages/329.html) |
| 60 | University of British Columbia | 2008 | Human Early Learning Partnership | Website (http://www.earlylearning.ubc.ca/) |

Appendix C. Study 1 List of Items from Review of Literature and Focus Group Discussions

Self-efficacy related

1. Feed my child in a timely manner so that s/he is in a mood that s/he is capable of participating in the structured physical activity without melting down on the day of the activity
2. Pack a snack for my child to take with her/him to the structured physical activity on the day of the activity
3. Get my child ready for her/his structured physical activity on the day of the activity
4. Decide what the appropriate structured physical activities are for my child to participate in
5. Balance my lifestyle, my family values, and my child's personality when choosing what structured physical activity to sign my child up for
6. Narrow the options of structured physical activities down and then ask my child to pick which one(s) s/he wants to do
7. Plan for my child's structured physical activity well in advance of registration deadlines to avoid the desired structured physical activity from being booked
8. Seek out information about new opportunities for my child to do structured physical activity
9. Gather information about what structured physical activities are available for my child to participate in
10. Schedule enough structured physical activity each week for my child so s/he is physically active enough for health benefits
11. Set goals for how much structured physical activity I would like my child to do

12. Stick to the goals I set for my child's structured physical activity
13. Develop a specific plan to get my child to do the type of structured physical activity I want her/him to do
14. Plan when my child will participate in structured physical activity for the entire year
15. Coordinate my child's structured physical activity schedule with her/his friends -so they can do the same structured physical activities together
16. Coordinate my child's structured physical activity schedule with other mothers that are my friends so our children are participating in the same structured physical activities
17. Coordinate and balance my work schedule with my child's structured physical activity schedule
18. Coordinate my child's structured physical activity schedule with a family I trust so they can drive my child when I cannot drive her/him
19. Influence significant people in my child's life, such as other family members who are not supportive of him/her doing structured physical activity
20. Influence the physical activity facilities in my neighborhood to provide structured physical activity programs or classes for preschool children
21. Get neighborhood groups involved in working to help get more structured physical activity opportunities for preschool children
22. Get my workplace involved in helping their employees provide more structured physical activity opportunities for preschool children
23. Schedule out of town trips for work around my child's structured physical activity schedule
24. Keep track of the types of structured physical activities my child does

25. Keep track of the intensity of the structured physical activities my child does
26. Keep track of the total time my child participates in structured physical activities
27. Make helping my child do structured physical activity a priority in my life
28. Make helping my child do structured physical activity a routine
29. Organize my schedule in order to help my child do structured physical activity
30. Schedule structured physical activity for myself that my child can watch me do
31. Take my child to her/his structured physical activity even when there are other things I could be doing
32. Manage my family's other commitments so I can take my child to structured physical activity
33. Prepare in advance so that nothing interferes with the time I have scheduled for my child's structured physical activity
34. Identify in advance the factors that may interfere with my child's structured physical activity
35. Anticipate when problems might arise that might interfere with my child's structured physical activity
36. View the times when I cannot take my child to structured physical activity as challenges to overcome rather than failures
37. Prevent other activities from interfering with my child's structured physical activity
38. Take my child to her/his structured physical activity even when I am tired and have no energy
39. Take my child to her/his structured physical activity even when I am sick

40. Take my child to her/his structured physical activity outdoors when the weather is rainy/snowy, cold/hot, and/or windy
41. Be flexible on the day of the activity when my child's structured physical activity is weather dependent
42. Think ahead about what I will need when packing things to take with us to the structured physical activity on the day of the activity
43. Leave work early to take my child to her/his structured physical activity on the day of the activity
44. Influence my work schedule so I can take my child to her/his structured physical activity on the day of the activity
45. Organize my family so that we either meet at the event or meet somewhere else and go together on the day of the activity
46. Get other parents, peers, or family members to help me when problems interfere with my abilities to take my child to her/his structured physical activity
47. Coordinate with my family so they can do the structured physical activity with my child when I cannot participate on the day of the activity
48. Coordinate with my family about who is going to take my child to her/his structured physical activity on the day of the activity
49. Coordinate with family members so they can come to my child's structured physical activity to cheer on the day of the activity
50. Avoid melt downs while at the structured physical activity by helping my child get enough sleep on the day of the activity

51. Avoid melt downs while at the structured physical activity by helping my child not feel hungry on the day of the activity
52. Check ahead of time about whether a snack is provided or if my child can bring her/his own snack to the structured physical activity on the day of the activity
53. Plan ahead to have our family meal ready to eat before my child's structured physical activity on the day of the activity
54. Plan ahead to eat our family meal when we come back from my child's structured physical activity on the day of the activity
55. Organize everything related to my child's structured physical activity in my head without making a list
56. Create a refrigerator calendar of my child's structured physical activity schedule
57. Enter my child's structured physical activities into my palm pilot, on-line calendar, or other computer-based calendar
58. Keep my child focused on the structured physical activity when the play park is right next to the structured physical activity facility on the day of the activity
59. Find somebody to watch my other child(ren) while I take my child to her/his structured physical activity
60. Find something for my other child(ren) to do or play with while we are at my child's structured physical activity

Outcome expectations related

1. See physical activity as valuable
2. Increase her/his initiative for creating his/her own physical activity opportunities
3. Increase her/his a sense of responsibility for his/her own physical activity pursuits

4. Increase her/his problem-solving skills
5. Increase her/his decision-making skills
6. Learn to rely on others to create and provide physical activity opportunities for her/him
7. Get picked on or bullied by other children
8. Interact with children who are nice and good for her/him
9. Increase her/his respect for authority
10. Be better at sports than other children his/her age
11. Be involved in the same activities as other children in his/her neighborhood
12. Get in trouble
13. Be stressed
14. Increase her/his competence in many different physical skills
15. Increase her/his fundamental movement skills
16. Increase her/his physical activity skills, such as catching, throwing, and kicking
17. Increase her/his or increase her/his coordination
18. Increase her/his balance
19. Get hurt or injured
20. Increase her/his creativity and imagination
21. Enjoy the structured physical activities
22. Increase her/his independent sense of self
23. Increase her/his mental abilities
24. Increase her/his bone and muscle development
25. Increase her/his self-esteem
26. Increase her/his focus and discipline

27. Increase her/his sportsmanship
28. Increase her/his skills to interact with other children
29. Achieve health benefits
30. Burn off energy
31. Understand the benefits of structured physical activity
32. Enjoy interacting with the other children
33. Interact with other children her/his age
34. Become more comfortable around children her/his own age
35. Meet other children in the community that are not necessarily the children s/he goes to school with
36. See other children doing physical activities
37. Get out of the house and do something
38. Get to do something with her/his parent(s)
39. Learn to work with a team
40. Learn about teamwork
41. Learn to differentiate between being kind, polite, and courteous when participating in unstructured physical activity (playing) and being competitive and understanding the rules of the games typically done in structured physical activity
42. Learn to adjust to children on her/his team and be able to work with them as a team
43. Learn to adjust to new things
44. Learn to love structured physical activity
45. Learn how to fall in a safe environment

46. Learn to be safe and comfortable in many different physical activities (including swimming)
47. Learn to do activities that other children her/his age are doing
48. Learn to do physical activities that are valued by society
49. Learn to do physical activities that the rest of the family enjoys
50. Learn to follow directions/instructions from an adult that is not her/his parent
51. Learn to work things out with other children on her/his own without an adult stepping in
52. Learn about the importance of community
53. Learn about sharing equipment and taking turns
54. Increase her/his self-confidence to accomplish physical tasks
55. Increase her/his confidence in interacting with adults
56. Increase her/his confidence to do something without her/his parents
57. See that s/he can do physical activities that s/he previously thought s/he was not capable of
58. See that it's okay if s/he can't do physical activities really well
59. See her/himself as a powerful person with a strong body
60. Broaden her/his horizons
61. Be exposed to a wide range of activities
62. Be exposed to new things
63. Be embarrassed because s/he cannot do physical activities that other children can do
64. Be embarrassed if s/he does not do the activity correctly
65. Be afraid of being laughed at if the physical activity is not done correctly
66. Hesitate to do structured physical activity again

67. Hesitate to try new things out of fear of not being good at the activity
68. Take ownership in a structured physical activity that is her/his own
69. See that physical activity is not about winning but having fun
70. Be turned off to physical activity because s/he is overwhelmed and overly stressed
71. Be overscheduled and not have opportunities to just play
72. Feel as though s/he is too structured and every night of the week s/he is going somewhere
73. Have to give up something that s/he likes because s/he has to spend that specific time of day doing structured physical activity
74. See structured physical activity as a competitive activity
75. Be pressured to pick a structured physical activity and focus only on it from now on
76. Hurt or injure another child
77. Interact with children that have behavioral problems
78. Interact with children that are out of control
79. Be confused by the rules of the structured physical activity
80. Be exposed to an aggressive sport mentality
81. Be exposed to activities that s/he may not pick up at home because her/his family is not interested in them
82. Build a healthy physical activity habit for life
83. Enjoy the long term health benefits of regular physical activity
84. Develop long term friendships with many different people
85. Be exposed to a lot of different coaches
86. Remain interested in learning about new structured physical activities
87. Learn skills that s/he will not have to learn at an older age when it is harder to learn

88. Stake her/his personal identity on the structured physical activity in which s/he participates
89. Develop a love for the structured physical activity the rest of the family enjoys
90. Be focused on sports and lose interest in arts, music, and academic pursuits
91. Develop a passion for something outside of school
92. Develop self-esteem for performing in front of audiences
93. Want to work in the world
94. Be on a professional sports team when s/he is older
95. Learn to manage and be responsible for her/his own activities when s/he is older Have a variety of structured physical activity choices that s/he can choose from when s/he is older
96. Learn the skills needed for sports participation when s/he is older
97. Be stressed when s/he is older because s/he has been overscheduled for so long
98. Choose to do structured physical activities when s/he is older
99. Have an activity that will keep her/him out of trouble when s/he is older
100. Have a large social network when s/he is older
101. Have a nice peer group where they look after each other when s/he is older
102. Have the confidence in her/his physical activity abilities to choose what structured physical activities s/he wants to do when s/he is older
103. Have the skills to be able to be competitive in sports when s/he is older
104. Be able to try out and make competitive sports teams when s/he is older
105. Really love the activity and continue to pursue it at a competitive level when s/he is older

106. Be satisfied with the amount of physical activity in which your child participates
107. Socialize with other parents that have young children
108. Get out of the house
109. Get your work done while your child is participating in the structured physical activity
110. Get a break from your regular routine
111. Get a break and have time to yourself
112. Be proud of your child
113. Be proud of yourself for doing an okay job at parenting
114. Feel like a good mother

List of items after cross referencing focus groups and review of literature

Self-regulatory efficacy related

1. Take my child to the activity even when there are other things I could be doing
2. Manage my family's other commitments so I can take my child to her/his activity
3. Prepare in advance so that nothing interferes with the time I have scheduled for the activity
4. Identify in advance the factors that may interfere with my child's activity
5. Anticipate when problems might arise that might interfere with the activity
6. View the times when I cannot take my child to the activity as challenges to overcome rather than failures
7. Prevent other activities from interfering with the activity
8. Take my child to the activity even when I am tired and have no energy
9. Take my child to the activity even when I am sick
10. Take my child to the activity when the weather is rainy/snowy, cold/hot, and/or windy

11. Keep my schedule flexible when the activity is weather dependent
12. Think ahead about what I will need when packing things to take with us to the activity
13. Leave work early to take my child to the activity
14. Influence my work schedule so I can take my child to the activity
15. Organize family transportation so that we either meet at the activity or meet somewhere else and go together
16. Get other parents, peers, or family members to help me when problems interfere with my abilities to take my child to the activity
17. Coordinate with my family (grandparents, aunts, uncles, or partner) so they can participate in the activity with my child when I cannot participate
18. Coordinate with my family (grandparents, aunts, uncles, or partner) about who is going to take my child to the activity
19. Coordinate with family (grandparents, aunts, uncles, or partner) so they can come to the activity to cheer
20. Avoid melt downs while at the activity by helping my child get enough sleep
21. Avoid melt downs while at the activity by helping my child not feel hungry
22. Check ahead of time about whether a snack is provided or if my child can bring her/his own snack to the activity
23. Plan ahead to have our family meal ready to eat before leaving for the activity
24. Plan ahead to eat our family meal when we come back from the activity
25. Organize the things needed for the activity in my head without making a written list
26. Create a refrigerator calendar of the activity schedule

27. Enter the activity schedule into my palm pilot, on-line calendar, or other computer-based calendar
28. Keep my child focused on the activity when the play park is right next to the activity facility
29. Find somebody to watch my other child(ren) while I take my child to the activity
30. Find something for my other child(ren) to do or play with while we are at the activity

Outcome expectation related

1. See the activity as an enjoyable activity that is done for fun.
2. Learn to love the activity.
3. Understand the benefits of participating in physical activity in general.
4. Enjoy interacting with the other children.
5. Take ownership in the activity.
6. Interact with children who are nice and good for her/him.
7. Interact with children that have behavioral problems.
8. Increase her/his skills to interact with other children.
9. Become more comfortable around children her/his own age.
10. Learn to work things out with other children on her/his own without an adult stepping in.
11. Learn to do activities that other children her/his age are doing.
12. Be involved in the same activities as other children in his/her neighborhood.
13. Meet other children in the community.
14. See other children participating in physical activities.
15. Increase her/his problem-solving skills.
16. Increase her/his decision-making skills.

17. Increase her/his creativity and imagination.
18. Learn to rely on others to create and provide physical activity opportunities for her/him.
19. Be better at physical tasks than other children his/her age.
20. Be exposed to a wide range of activities.
21. Increase her/his ability to do physical activity skills, such as catching, throwing, and kicking.
22. Increase her/his self-confidence to accomplish physical tasks.
23. Increase her/his coordination.
24. Increase her/his balance.
25. Increase her/his focus.
26. Increase her/his discipline.
27. Learn about sportsmanship.
28. Learn about teamwork.
29. Learn to follow directions from an adult that is not her/his parent.
30. Increase her/his self-confidence to interact with adults.
31. Increase her/his respect for authority.
32. Increase her/his self-confidence to do an activity <u>without</u> her/his parents.
33. Learn to do physical activities that the rest of the family enjoys.
34. Be exposed to activities in which our family <u>does not</u> participate.
35. Develop strong bones.
36. Develop strong muscles.
37. Burn off energy.

38. Learn to differentiate between being polite when playing and being competitive when participating in sports.
39. Be confused by the rules of the activity.
40. Learn about sharing equipment and taking turns.
41. Learn to adjust to new things.
42. Learn how to be safe and comfortable participating in many different types of physical activities.
43. See that it's okay if s/he cannot do physical activities really well.
44. See her/himself as a powerful person with a strong body.
45. Increase her/his self-esteem.
46. Be embarrassed if s/he cannot do the activity correctly.
47. Be embarrassed if s/he cannot do the activity when other children can do it.
48. Get picked on or bullied by other children.
49. Get hurt or injured.
50. Hurt or injure another child.
51. Not want to do the activity again.
52. Hesitate to try new things out of fear of not being good at the activity.
53. See the activity as a competition that needs to be won.
54. Be exposed to an aggressive sport mentality.
55. Be stressed.
56. Feel like s/he is always going somewhere.
57. Have fewer opportunities to just play.
58. Have to give up something that s/he likes.

Appendix D. Recruiting Announcements and Consent Forms

Recruiting Phase 2

# Research survey about preschooler's physical activity

Hi! My name is Candace and I am working on my PhD in Kinesiology at the University of Saskatchewan.

I am inviting mothers of preschool children to complete a survey about their thoughts related to their preschool child's physical activity.

I am looking for mothers who have at least one child between the ages of 2 and 5 years of age who can complete a 30 minute on-line survey.

The survey will ask mothers about their thoughts related to her child's structured physical activity. Structured physical activity is any activity that the child has to sign up or register for, such as tumbling, swimming or dance class/lessons, or playing on a sports team.

Here is the link to the survey. Just type this address in your web browser and complete the survey. It is very quick and easy.

https://survey.usask.ca/survey.php?sid=8687

If you have any questions or comments please contact me.

**My email address is candace.bloomquist@usask.ca or my office phone number is 966-1099.**

Thank you!
Candace Bloomquist

Recruiting Phase 3

# FREE on-line survey for mothers

Researchers in the College of Kinesiology at the University of Saskatchewan are inviting mothers of preschool-aged children to complete two short on-line surveys about their thoughts related to their preschool child's physical activity.

If you are a mother that is at least 18 years of age with a child between 2 and 5 years of age we would like to invite you to participate in a survey at the following website:

**https://survey.usask.ca/survey.php?sid=8687**

Please go to the link and participate soon! Just type the web address into your web browser and complete the survey. It is very quick and easy.

If you have any questions or comments about the survey please contact me at candace.bloomquist@usask.ca.

Your participation is extremely important! Thank you kindly!

Consent Form Study 1: Phase 2 - Focus Group Participants

You are invited to participate in a study titled "Parental social cognitions to facilitate structured physical activity opportunities for preschool children". Please read this form carefully. Feel free to call, fax, email, and/or visit directly any of the researchers with any questions you might have.

Researchers:
1) Nancy Gyurcsik, Ph. D., College of Kinesiology, University of Saskatchewan, 87 Campus Drive, Saskatoon, SK S7N 5B2
Phone: (306) 966-1075
Fax: (306) 966-6464
Email: nancy.gyurcsik@usask.ca

2) Lawrence Brawley, Ph.D., College of Kinesiology, University of Saskatchewan, 87 Campus Drive, Saskatoon, SK S7N 5B2
Phone: (306) 966-1076
Fax: (306) 966-6464
Email: larry.brawley@usask.ca

3) Kevin Spink, Ph.D., College of Kinesiology, University of Saskatchewan, 87 Campus Drive, Saskatoon, SK S7N 5B2
Phone: (306) 966-1074
Fax: (306) 966-6464
Email: kevin.spink@usask.ca

4) Candace Bloomquist, Ph.D. candidate, College of Kinesiology, University of Saskatchewan, 87 Campus Drive, Saskatoon, SK S7N 5B2
Phone: (306) 966-1099
Fax: (306) 966-6464
Email: candace.bloomquist@usask.ca

Purpose and Procedure: The purpose of this study is to develop a measurement tool to examine mothers' thoughts about their children's physical activity participation. If you agree to participate, you will be invited to take part in a focus group interview. During the interview you are free to answer only the questions you are comfortable with and may request the tape recorder be turned off at any time. If you are uncomfortable taking part in a group interview arrangements will be made for you to answer the interview questions in a one on one setting, with one of our researchers. The interview will take place on the campus of the University of Saskatchewan. The interview will take approximately one hour in total to complete and will be free of charge.

Potential Risks: There are no expected physical or psychological risks associated with participation in this focus group.

Potential Benefits: The goal of this research is to develop a measurement tool to help us better understand mothers' thoughts about their children's physical activity participation. This

information may enable the development of future programs to help parents facilitate structured physical activity opportunities for their children. Please note that there is no guarantee that you will benefit directly from participating in this study.

Storage of Data: All data obtained from the focus group will be stored in a locked filing cabinet in the office of Dr. Nancy Gyurcsik at the University of Saskatchewan for five years. Only the researchers will have access to the data.

Confidentiality: The data collected will be kept as anonymous and confidential as possible. However, as group interviews are involved in the study, there are limits to which confidentiality of information can be ensured, as discussion will take place amongst the group members. We will make every effort to stress the importance of understanding and respecting issues of privacy in-group settings during the focus group interview. Only the research team will have access to the data. The data from the focus group will be used for a doctoral thesis and published and presented at conferences in group form, so that it will not be possible to identify individuals.

Right to Withdraw: You may withdraw from the study for any reason, at any time, and refuse to answer an individual item(s) on any of the surveys, without penalty of any sort. If you decide to withdraw your data will be deleted.

Data/Transcript Release: Any information you give to our research team will be kept private and not shared with other students or teachers. After the interview, you will be given the opportunity to review the transcript of your interview, and to add, alter, or delete information from the transcripts as you see fit.

Questions: If you have any questions concerning the study, please feel free to call, fax, email, or ask any of the researchers directly. You are also free to contact the researchers if you have questions at a later time. This study has been approved on ethical grounds by the University of Saskatchewan Behavioural Research Ethics Board on XXXX. Any questions regarding your rights as a participant may be addressed to the committee through the Ethics Office in the Office of the Vice President Research (306 966-2975). Out of town participants may call collect.
To receive a copy of the results please provide your email address on the survey.

Consent to Participate: I have read and understood the description provided above. I have been provided with an opportunity to ask questions and my questions have been answered satisfactorily. I consent to participate in the study as described above, understanding that I may withdraw this consent at any time. A copy of this consent form has been given to me for my records.

| | |
|---|---|
| _____ | _____ |
| Participant signature | Date |
| _____ | _____ |
| Researcher signature | Date |

Consent Form Study 1: Phase 3, Project 1

You are invited to participate in a study titled "Parental social cognitions to facilitate structured physical activity opportunities for preschool children". Please read this form carefully. Feel free to call, fax, email, and/or visit directly any of the researchers with any questions you might have.

Researchers:
1) Nancy Gyurcsik, Ph. D., College of Kinesiology, University of Saskatchewan, 87 Campus Drive, Saskatoon, SK S7N 5B2
Phone: (306) 966-1075
Fax: (306) 966-6464
Email: nancy.gyurcsik@usask.ca

2) Lawrence Brawley, Ph.D., College of Kinesiology, University of Saskatchewan, 87 Campus Drive, Saskatoon, SK S7N 5B2
Phone: (306) 966-1076
Fax: (306) 966-6464
Email: larry.brawley@usask.ca

3) Kevin Spink, Ph.D., College of Kinesiology, University of Saskatchewan, 87 Campus Drive, Saskatoon, SK S7N 5B2
Phone: (306) 966-1074
Fax: (306) 966-6464
Email: kevin.spink@usask.ca

4) Candace Bloomquist, Ph.D. candidate, College of Kinesiology, University of Saskatchewan, 87 Campus Drive, Saskatoon, SK S7N 5B2
Phone: (306) 966-1099
Fax: (306) 966-6464
Email: candace.bloomquist@usask.ca

Purpose and Procedure: The purpose of this study is to help us better understand the relationship between different parental thoughts related to their children's physical activity participation. If you agree to participate, you will be invited to fill out one (1) survey on the internet that will take approximately 25 minutes to do. To complete the survey you will be asked to go to a web-based link. You will be asked to fill out the survey at a computer of your choosing when it is convenient for you.

Potential Risks: There are no expected physical or psychological risks associated with participation in this study.

Potential Benefits: The goal of this research is to examine the relationship between mothers' different thoughts about their children's physical activity participation. This information may enable the development of future programs to help parents facilitate structured physical activity

opportunities for their children. Please note that there is no guarantee that you will benefit directly from participating in this study.

Storage of Data: All data obtained from the survey will be stored on a memory stick, which will, in turn, be stored in a locked filing cabinet in the office of Dr. Nancy Gyurcsik at the University of Saskatchewan for five years. Only the researchers will have access to the data.

Confidentiality: You will not be asked to provide your name on the survey. You will be asked to provide your email address if you would like the results of the study emailed to you. By providing your email address there is potential to be identified and therefore there is a chance of the loss of anonymity. However, your email address will be deleted immediately upon completion of the study. If at any time, you do not wish to be contacted about the survey, please call, fax, or email one of the researchers listed above. At that time, you will no longer be contacted. As well, upon study completion, your email address will be deleted and the researchers will no longer have any record of your address. Only the research team will have access to the data. The data from the study will be used for a doctoral thesis and published and presented at conferences in group form, so that it will not be possible to identify individuals.

Right to Withdraw: You may withdraw from the study for any reason, at any time, and refuse to answer an individual item(s) on the survey, without penalty of any sort. If you decide to withdraw your data will be deleted.

Questions: If you have any questions concerning the study, please feel free to call, fax, email, or ask any of the researchers directly. You are also free to contact the researchers if you have questions at a later time. This study has been approved on ethical grounds by the University of Saskatchewan Behavioural Research Ethics Board on XXXX. Any questions regarding your rights as a participant may be addressed to the committee through the Ethics Office in the Office of the Vice President Research (306 966-2975). Out of town participants may call collect.
To receive a copy of the results please provide your email address on the survey.

Consent to Participate: I have read and understood the description provided above. I have been provided with an opportunity to ask questions and my questions have been answered satisfactorily. I consent to participate in the study as described above, understanding that I may withdraw this consent at any time. By completing the survey online via the web, I am consenting to participate in the study.

Consent Form Study 1: Phase 3, Project 2

You are invited to participate in a study titled "Parental social cognitions to facilitate structured physical activity opportunities for preschool children". Please read this form carefully. Feel free to call, fax, email, and/or visit directly any of the researchers with any questions you might have.

Researchers:
1) Nancy Gyurcsik, Ph. D., College of Kinesiology, University of Saskatchewan, 87 Campus Drive, Saskatoon, SK S7N 5B2
Phone: (306) 966-1075
Fax: (306) 966-6464
Email: nancy.gyurcsik@usask.ca

2) Lawrence Brawley, Ph.D., College of Kinesiology, University of Saskatchewan, 87 Campus Drive, Saskatoon, SK S7N 5B2
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3) Kevin Spink, Ph.D., College of Kinesiology, University of Saskatchewan, 87 Campus Drive, Saskatoon, SK S7N 5B2
Phone: (306) 966-1074
Fax: (306) 966-6464
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4) Candace Bloomquist, Ph.D. candidate, College of Kinesiology, University of Saskatchewan, 87 Campus Drive, Saskatoon, SK S7N 5B2
Phone: (306) 966-1099
Fax: (306) 966-6464
Email: candace.bloomquist@usask.ca

Purpose and Procedure: The purpose of this study is to develop a measurement tool to examine mothers' thoughts about their children's physical activity participation. If you agree to participate, you will be invited to fill out two (2) surveys on the internet that will take approximately 25 minutes each to do. You will be asked to fill out the surveys over the next week. To complete the first survey you will be asked to go to a web-based link. The second survey will then be emailed to you 2 days after you complete the first survey. You will be asked to complete the surveys at a computer of your choice at a time of your choice during the week that you receive the email.

Potential Risks: There are no expected physical or psychological risks associated with participation in this study.

Potential Benefits: The goal of this research is to develop a measurement tool to help us better understand mothers' thoughts about their children's physical activity participation. This

information may enable the development of future programs to help parents facilitate structured physical activity opportunities for their children. Please note that there is no guarantee that you will benefit directly from participating in this study.

Storage of Data: All data obtained from the surveys will be stored on a memory stick, which will, in turn, be stored in a locked filing cabinet in the office of Dr. Nancy Gyurcsik at the University of Saskatchewan for five years. Only the researchers will have access to the data.

Confidentiality: You will not be asked to provide your name on any of the surveys. You will be asked to provide your email address so that we can send you the second survey. By providing your email address there is potential to be identified and therefore there is a chance of the loss of anonymity. However, your email address will be deleted immediately upon completion of the study. If at any time, you do not wish to be contacted about the survey, please call, fax, or email one of the researchers listed above. At that time, you will no longer be contacted. As well, upon study completion, your email address will be deleted and the researchers will no longer have any record of your address. Only the research team will have access to the data. The data from the study will be used for a doctoral thesis and published and presented at conferences in group form, so that it will not be possible to identify individuals.

Right to Withdraw: You may withdraw from the study for any reason, at any time, and refuse to answer an individual item(s) on any of the surveys, without penalty of any sort. If you decide to withdraw your data will be deleted.

Questions: If you have any questions concerning the study, please feel free to call, fax, email, or ask any of the researchers directly. You are also free to contact the researchers if you have questions at a later time. This study has been approved on ethical grounds by the University of Saskatchewan Behavioural Research Ethics Board on XXXX. Any questions regarding your rights as a participant may be addressed to the committee through the Ethics Office in the Office of the Vice President Research (306 966-2975). Out of town participants may call collect.
To receive a copy of the results please provide your email address on the survey.

Consent to Participate: I have read and understood the description provided above. I have been provided with an opportunity to ask questions and my questions have been answered satisfactorily. I consent to participate in the study as described above, understanding that I may withdraw this consent at any time. By completing the survey online via the web, I am consenting to participate in the study.

Consent Statement Study 2: Web-based surveys

Your participation in this survey is completely voluntary. It will not take you very long to complete the survey. Please read each question carefully and complete it to the best of your ability. There are not right or wrong answers so please give your immediate reaction. You are free to not answer any question. You can withdraw from this survey at any time without consequence.

Your responses will be kept strictly anonymous. You must be at least 18 years of age and a mother with a child between 2 and 5 years of age in order to complete this survey. By doing this survey, you are consenting to participate.

This study has been approved on ethical grounds by the University of Saskatchewan Behavioural Research Ethics Board on May 12, 2008. Any questions regarding your rights as a participant may be addressed to the committee through the Ethics Office in the Office of the Vice President Research (966-2084). Out of town participants may call collect. If you have any questions about the survey or would like the final results of the survey emailed to you, please email us at candace.bloomquist@usask.ca.

Email Address: _____
Confirm Email address: _____

Appendix E. Study 1 Focus Group Interview Guide

Introduction:

Welcome and thank you for coming today. [Complete informed consent]

1. Description of my goals and the purpose of the group discussion.

The purpose of the focus group is to develop items for a measurement tool that will be used to assess the thoughts of mothers of preschool children regarding their child's structured physical activity. I will be asking you about some of your experiences related to your child's participation in structured physical activities. This process and the information gathered today is very important for developing the survey that will be used in the remainder of the studies that I will conduct for my doctoral thesis.

2. Why are you here?

Think of this as a collaborative process. You are the experts on being mothers and on your children and we are working together to develop ideas about the items that will be used on the survey. This collaborative process allows the survey to have real meaning because the ideas came from real people that have experience in real situations.

3. Clarify the process and what will happen during the discussion.

- There are not right or wrong answers to the questions I will ask you. I expect you will have different points of view, please share even if what you have to say differs from what others have said. I am looking for honest feedback and am interested in both positive and negative comments- don't be shy. Although you might have heard about some of the things we talk about today in the popular press. I am more interested in

hearing about the things that you actually think about and which things specifically apply to you and your child. So I would like to know what is specifically relevant to you not just what the media thinks is important. (What you actually do.)

- The tape recorder can be shut off at any time.
- Only the research team will listen to the tape. All of the information gathered during today's session will be reported in aggregate or group form. Names will not be associated with this data. You will be given a pseudonym. Please keep confidential all information discussed during this focus group.
- I'm interested in hearing from each of you. So, for each question we will first go around the table to hear from each person, then we will open it up for anyone to add anything they didn't mention the first go around. I've also provided a pad of paper for you to make notes about any of the questions that I ask. When you make a note reference the number of the question and jot down your thoughts about the question. If we don't get a chance to hear from you at least I will have your notes and can follow-up with you about your note. If I ask you to elaborate on something, it's not to single you out but to make sure I understand what you have to say.
- Feel free to ask me any questions as we go along if something is unclear.

4. Definitions – getting everyone on the same page to start.

To start I would like to define for you structured physical activity. Structured physical activity is any activity that is organized and initiated by an adult and is planned for a specific time and place. I would like to focus our discussion today on a very specific type of structured physical activity, that is, activities your child has to sign up or register for, such as participating

in a tumbling, dance or swim class/lesson and/or playing on a hockey, soccer team, or any other sport team. Structured physical activity is different from unstructured physical activity which is activity that is initiated by the child and occurs as the child explores his or her environment. Unstructured physical activity would be considered active play whereas the focus of our discussion today is on structured physical activity, which is physical activity directed by an adult that your child has to sign up for.

I would like to invite you to think only about the child living in your home that is currently 2 to 5 years old (choose 1 of your children). Think back to the times your child participated in structured physical activity. Take a moment and try to recall as many details as possible about these activities and the things leading up to these activities. When your child does structured physical activity, what kind(s) of activities does he/she do?

I have six main questions that I would like to ask you about today. As we go through the questions I will let you know what number we are on so that if you want to jot down a note you can reference the question number we are on.

1. One of the things I've been thinking about is the importance of the things that you have to do so that your child does structured physical activity. For example providing transportation to and from the facilities and gathering the equipment needed for the activity-do you do these things and what other activities do you actually do to help your child do structured physical activity?

2. Another thing I was thinking about is the importance of organizing all of the other things in your life so that your child does structured physical activity. For example planning your daily or weekly schedule around your child's activity and coming up with strategies to overcome

challenges that may stop your child from doing the activity, maybe you ask other parents, friends or family members to help you with certain things. Do you do these things and what other things do you have to do to prepare for your child to do structured physical activity?

3. I also wonder about the things that drive you or motivate you to get your child to these activities. Specifically I was wondering about what you think in regards to the outcomes that you and your child get because your child does structured physical activity. If I could invite you to think about what the physical outcomes, the social outcomes, and also the outcomes that deal with how you feel about yourself or how your child might feel about him/herself. So when you are thinking about the things you think about in regards to the outcomes that motivate you to get your child to the activity try to think about each of these different categories.

- What are the positive or beneficial outcomes that your child is getting right now that happen because your child is doing structured physical activity now? For example, because your child does structured activity your child gets to be involved in social activities with other children his/her own age.

- What are some outcomes that might not be positive that result because your child does structured physical activity? These might be things like your child will get hurt or injured or your child will get picked on by other children.

4. We just talked about what you child gets as a result of doing structured activity, now I am wondering about what you get because your child is involved in structured activity. What are the positive or beneficial outcomes that you get because your child is involved in structured physical

activity now? For example you feel like a good parent and you get to socialize with other parents.

- What are some outcomes that might not be positive that result for you as a result of your child doing structured physical activity? For example you have less money because of the participation or equipment fees and you are stressed out.

5. I was also wondering about the outcomes you think about that motivate you that you or your child will get later, a few years down the road. You may have heard in the media that if your child does structured physical activity s/he will be smarter or that you child must do structured physical activity now so s/he will be an Olympic athlete. Maybe what you believe is in line with what you hear about in the media and maybe it is not what I am wondering if there is anything you specifically think about.

- What are the future outcomes (positive and negative) that <u>your child</u> would get because your child is doing structured physical activity now?
- What are the future outcomes (positive and negative) that <u>you would</u> get because (your child is involved in) you are helping your child do structured physical activity now?

6. Do you make intentions for your child to do a certain amount of structured physical activity? Does you make a goal in advance about what activities, how much, and how often you want your child to do structured physical activity? What other factors do you consider when making goals for your child to do structured physical activity?

Wrap up- Can you think of anything else about you or your child regarding the structured physical activity he/she does that we haven't talked about yet?

To save some time today, I would like to send you an email with a link to a short on-line survey that asks demographic questions. There will also be space for you to write about anything else you want to add.

Thank You!!

Appendix F. Study 1 Items Used in Phase 3, Project 1

Self-regulatory efficacy to overcome barriers

1. My house is not clean and I am expecting guests.
2. Another family member (like my partner or parents) needs me to spend time with them at the same time as the activity.
3. I need to work at the same time as the activity.
4. I am sick.
5. The weather is very bad (hot, humid, rainy, snowy, cold, icy).
6. My child is having a 'melt down' at that time.
7. There is only one vehicle for our family to use and it is being used at that time.
8. I cannot leave work early.
9. My car breaks down (e.g., have a flat tire).
10. I cannot find the equipment (shoes, uniform, padding) needed for my child's activity (e.g., it is lost).
11. I cannot find somebody to watch my other child(ren).
12. My other child(ren) is/are sick.

Self-regulatory efficacy to schedule/plan

1. Schedule my family's other commitments (e.g., holidays).
2. Keep my schedule flexible.
3. Change my work schedule.
4. Change my personal physical activity schedule.
5. Prepare in advance so that nothing interferes with the time I have scheduled to take my child to the activity.

6. Plan ahead so other activities will not interfere with taking my child to the activity.
7. Pack the things my child needs for the activity ahead of time.
8. Prepare my child (get dressed, fed, etc) for the activity ahead of time.

Outcome expectation related

1. Build her/his self-confidence to try new activities?
2. Develop strong muscles?
3. Burn off energy?
4. Increase her/his self confidence to do an activity without her/his parents?
5. Become more comfortable around children her/his own age?
6. Make new friends?
7. Develop specific movement skills?
8. Develop a habit for lifelong physical activity participation?

Appendix G. Study 1 Participant and Non-participant Demographic Differences

Comparison of participants and non-participants on the number of activities in which the mother and partner have participated

| | | *N* | *M* | *SD* | *t* | *df* | *p* |
|---|---|---|---|---|---|---|---|
| Mother | When young | | | | 1.27 | 55.3* | 0.21 |
| | Participant | 31 | 5.26 | 3.02 | | | |
| | Non-participant | 32 | 4.41 | 2.24 | | | |
| | When in high school | | | | 1.09 | 61 | 0.28 |
| | Participant | 31 | 3.00 | 2.45 | | | |
| | Non-participant | 32 | 2.41 | 1.83 | | | |
| | Currently | | | | 1.01 | 54.2* | 0.32 |
| | Participant | 31 | 0.58 | 0.92 | | | |
| | Non-participant | 32 | 0.38 | 0.66 | | | |
| Partner | When young | | | | 1.62 | 61 | 0.11 |
| | Participant | 31 | 3.68 | 2.34 | | | |
| | Non-participant | 32 | 2.75 | 2.20 | | | |
| | When in high school | | | | 1.60 | 61 | 0.11 |
| | Participant | 31 | 2.48 | 1.90 | | | |
| | Non-participant | 32 | 1.75 | 1.74 | | | |
| | Currently | | | | 0.69 | 61 | 0.50 |
| | Participant | 31 | 0.65 | 0.98 | | | |
| | Non-participant | 32 | 0.50 | 0.67 | | | |

* *t* and *df* adjusted because variances were not equal

Comparison of participants and non-participants on child's age, mother's age and number of children in family

| | *N* | *M* | *SD* | *t* | *df* | *p* |
|---|---|---|---|---|---|---|
| Child age | | | | 1.87 | 60 | 0.07 |
| Participant | 31 | 3.39 | 1.05 | | | |
| Non-participant | 31 | 2.90 | 0.98 | | | |
| Number of Children | | | | -0.76 | 61 | 0.45 |
| Participant | 31 | 1.90 | 0.83 | | | |
| Non-participant | 32 | 2.06 | 0.84 | | | |
| Mothers age | | | | 1.53 | 59 | 0.13 |
| Participant | 30 | 33.50 | 5.79 | | | |
| Non-participant | 31 | 31.13 | 6.29 | | | |

Chi-square analysis of family income among participants and non-participants

| | | Income | | | | |
|---|---|---|---|---|---|---|
| Variable | *N* | < $45,000 | $45-$90,000 | >$90,000 | $\chi^2$ | *p* |
| | | | | | 6.18 | <.05 |
| Participant | 30 | 5 | 12 | 13 | | |
| Non-participant | 28 | 9 | 15 | 4 | | |
| Totals | 58 | 14 | 27 | 17 | | |

Chi-square analysis of mother's education among participants and non-participants

| | | Education | | | | |
|---|---|---|---|---|---|---|
| Variable | *N* | High School or less | Some University | Post graduate | $\chi^2$ | *p* |
| | | | | | 7.74 | <.05 |
| Participant | 31 | 2 | 15 | 14 | | |
| Non-participant | 32 | 7 | 20 | 5 | | |
| Totals | 63 | 9 | 35 | 19 | | |

Chi-square analysis of partner's education among participants and non-participants

| | | Education | | | | |
|---|---|---|---|---|---|---|
| Variable | *N* | High School or less | Some University | Post graduate | $\chi^2$ | *p* |
| Mothers Take to SPA | | | | | 12.57 | <.05 |
| Participant | 30 | 3 | 15 | 12 | | |
| Non-participant | 30 | 12 | 16 | 2 | | |
| Totals | 60 | 15 | 31 | 14 | | |

Chi-square analysis of child's gender among participants and non-participants

| | | Gender | | | |
|---|---|---|---|---|---|
| Variable | *N* | Female | Male | $\chi^2$ | *p* |
| | | | | 1.29 | 0.256 |
| Participant | 31 | 13 | 18 | | |
| Non-participant | 32 | 18 | 14 | | |
| Totals | 63 | 31 | 32 | | |

Chi-square analysis of relationship status among participants and non-participants

| | | Relationship Status | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Variable | *N* | Married | Not married living w/ | Single-Never Married | Separated | Have partner not living w/ | $\chi^2$ | *p* |
| | | | | | | | 5.48 | 0.241 |
| Participant | 31 | 26 | 3 | 1 | 1 | 0 | | |
| Non-participant | 32 | 29 | 0 | 2 | 0 | 1 | | |
| Totals | 63 | 55 | 3 | 3 | 1 | 1 | | |

Comparison of participant and non-participant on number of activities in which the mother and partner have participated

| | | | *N* | *M* | *SD* | *t* | *df* | *p* |
|---|---|---|---|---|---|---|---|---|
| Mother | When young | | | | | 2.26 | 213 | 0.03 |
| | | Participant | 124 | 5.23 | 2.23 | | | |
| | | Non-participant | 91 | 4.48 | 2.61 | | | |
| | High school | | | | | 0.94 | 213 | 0.35 |
| | | Participant | 124 | 2.25 | 1.83 | | | |
| | | Non-participant | 91 | 2.02 | 1.83 | | | |
| | Currently | | | | | 2.30 | 213 | 0.02 |
| | | Participant | 124 | 0.66 | 0.83 | | | |
| | | Non-participant | 91 | 0.41 | 0.77 | | | |
| Partner | When young | | | | | 1.40 | 199 | 0.17 |
| | | Participant | 119 | 3.08 | 2.38 | | | |
| | | Non-participant | 82 | 2.62 | 2.20 | | | |
| | High school | | | | | -0.51 | 199 | 0.61 |
| | | Participant | 119 | 1.84 | 1.46 | | | |
| | | Non-participant | 82 | 1.95 | 1.58 | | | |
| | Currently | | | | | -0.09 | 199 | 0.93 |
| | | Participant | 119 | 0.56 | 0.74 | | | |
| | | Non-participant | 82 | 0.57 | 0.89 | | | |

Comparison of participants and non-participants on child's age, number of children in family, and mother's age

| | *N* | *M* | *SD* | *t* | *df* | *p* |
|---|---|---|---|---|---|---|
| Child's age | | | | 4.83 | 212 | 0.00 |
| Participant | 124 | 3.77 | 0.99 | | | |
| Non-participant | 90 | 3.09 | 1.08 | | | |
| Number of Children | | | | -1.64 | 167.3* | 0.10 |
| Participant | 122 | 2.06 | 0.79 | | | |
| Non-participant | 91 | 2.26 | 0.99 | | | |
| Mother's age | | | | 2.19 | 207 | 0.03 |
| Participant | 119 | 32.61 | 4.38 | | | |
| Non-participant | 90 | 31.14 | 5.30 | | | |

* *t* and *df* adjusted because variances were not equal

Chi-square analysis of family income among participants and non-participants

| | | Income | | | | | |
|---|---|---|---|---|---|---|---|
| Variable | N | <$45,000 | $45-90,000 | >$90,000 | $\chi^2$ | *p* | *Phi* |
| | | | | | 8.598 | 0.014 | 0.202 |
| Participant | 121 | 27 | 56 | 38 | | | |
| Non-participant | 89 | 36 | 35 | 18 | | | |
| Totals | 210 | 63 | 91 | 56 | | | |

Chi-square analysis of mother's education among participants and non-participants

| | | Education | | | | | |
|---|---|---|---|---|---|---|---|
| Variable | *N* | High School or less | Some University | Post graduate | $\chi^2$ | *p* | Phi |
| | | | | | 11.529 | 0.003 | 0.233 |
| Participant | 122 | 6 | 68 | 48 | | | |
| Non-participant | 91 | 15 | 55 | 21 | | | |
| Totals | 213 | 21 | 123 | 69 | | | |

Chi-square analysis of partner's education among participants and non-participants

| | | Education | | | | |
|---|---|---|---|---|---|---|
| Variable | *N* | High School or less | Some University | Post graduate | $\chi^2$ | *p* |
| | | | | | 2.102 | 0.35 |
| Participant | 117 | 13 | 65 | 39 | | |
| Non-participant | 80 | 10 | 51 | 19 | | |
| Totals | 197 | 23 | 116 | 58 | | |

Chi-square analysis of child's gender among participants and non-participants

| Variable | *N* | Gender | | $\chi^2$ | *p* |
|---|---|---|---|---|---|
| | | Female | Male | 0.646 | 0.422 |
| Participant | 124 | 64 | 60 | | |
| Non-participant | 91 | 52 | 39 | | |
| Totals | 215 | | | | |

Chi-square analysis of relationship status among participants and non-participants

| | | Relationship Status | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Variable | *N* | Married | Not married living w/ | Single-Never Married | Separated | Have partner not living w/ | Divorced | $\chi^2$ | *p* | *Phi* |
| | | | | | | | | 10.692 | 0.058 | 0.224 |
| Participant | 123 | 103 | 10 | 4 | 4 | 0 | 2 | | | |
| Non-participant | 91 | 65 | 9 | 9 | 2 | 4 | 2 | | | |
| Totals | 214 | 168 | 19 | 13 | 6 | 4 | 4 | | | |

Appendix H. Study 2 Recruiting Announcement

The College of Kinesiology at University of Saskatchewan with the support of the **in motion/en mouvement** partners Early Years strategy are inviting mothers of preschool aged children to participate in an important research project.

We recognize regular participation in physical activity help children build healthy bones and muscles, help reduce depression and anxiety, build confidence, and facilitate social interaction. Unfortunately, many children, even children as young as 2-5 years old, may not be physically active enough to achieve these benefits. One factor that plays a particularly important role in influencing physical activity participation among young children is parent involvement. The influence of parental involvement specifically related to preschool-aged children's structured physical activity participation has received little research attention to date. It is our hope that our research project will help determine how and why mothers take their young children to structured physical activities. This information can lead us to develop strategies to help more preschool-aged children participate in more health beneficial physical activity.

We are currently asking mothers that are at least 18 years of age, that have a child between 2 and 5 years of age to participate in two short on-line surveys. These surveys ask mothers about their thoughts related to their preschool child's physical activity. A link to the second survey will be emailed to the mothers approximately 4 weeks after they have completed the first survey. The surveys are confidential. You will not be asked to provide your name on any of the surveys. This research project has been approved by the Behavioural Ethics Board at the University of Saskatchewan.

By participating in the surveys you will be entered into a draw for a scholarship worth up to $200 for a University of Saskatchewan Children's Activity Camp Program for the summer of 2010.

The first survey can be completed right now at the following website:

https://survey.usask.ca/survey.php?sid=16209

For more information, please contact:
Candace Bloomquist
University of Saskatchewan
College of Kinesiology
cdb485@mail.usask.ca

Appendix I. Study 2: Surveys 1 and 2

**Survey 1 of Study 2**

PAGE 1

Structured physical activity is any physical activity your child has to be registered for that is organized and started by adults (e.g., community organizations/associations, clubs, leisure facilities, etc.).

Is your 2-5 year old child registered in any structured physical activity for the next 4 weeks?

☐ YES ☐ NO

What is the #1 reason that you have not registered your child in structured physical activity for the next 4 weeks?_____

When will your child be registered in a structured physical activity next? _____

May I email you during the time your child is registered in a structured physical activity so you can complete the survey then? ☐ YES ☐ NO

PAGE 2

Using this Survey

Please complete the survey by following the directions given on each page. You will have to do the entire survey at one time because your answers will not be saved until you have completed the entire survey.

Please do not discuss the statements with your family members while completing the survey. Respond to the statements based on what you actually do and think about. It is very important that we find out that mothers really think. For each question or statement select the response option that is most accurate.

There are two main sections: Section 1 is about you and your child and Section 2 is about your thoughts and beliefs regarding taking your child to structured physical activity.

Use the "Next Page" and "Previous Page" buttons to move through the survey. Do NOT use the "Back" or "Refresh/Reload" buttons in your browser while in the survey. They won't work.

The last page of the survey has a "Finish" button. Select that to save your survey results.

You can use the "Quit Survey - Do not save answers" button at any time to exit the survey without saving your answers.

PAGE 3
Section 1: About You

What is your family's estimated total income after taxes?

□ Less than $25,000
□ $25,000 - $44,999
□ $45,000 - $74,999
□ $75,000 - $89,999
□ $90,000 - $99,999
□ $100,000 and over

Are you currently:

□ Married □ Single- Never Married □ Not married, living with a partner □ Divorced □ Separated □ Widowed

Do you presently work outside the home for pay?

☐ Yes
☐ No

How many children live in your home? _____

Is this the first structured physical activity in which you have registered your child(ren)?

☐ YES ☐ NO

How often have you taken your child to structured physical activities in the past 3 months?

□ Zero (0) times
□ Less than 5 times
□ 6-11 times
□ 12-20 times
□ 24-30 times
□ 30 or more times

What is your age: _____(years)

Which of the following ethnic groups are you a member of?

□ White □ Chinese □ Black □ Filipino □ Latin American □ Southeast Asian □ South Asian □ West Asian □ North American Indian, Metis, or Inuit □ Arab □ Other

What is the highest level of education you have received?

□ Some high school □ High School Graduate □ Some college or technical school
□ Associates Degree □ College Graduate □ Some Graduate Work
□ Master's Degree □ PhD or professional degree

PAGE 4
What is the highest level of education your partner has received?

How often have you taken your child(ren) to structured physical activities in the past 3 months? Take into account all of the children in your household.
□ Less than 5 times
□ 6-11 times
□ 12-20 times
□ 24-30 times
□ 30 or more times

Age of oldest child _____

Sex of oldest child □**male** □ **female**

Check all of the structured physical activities in which your oldest child has participated.
☐Swim lessons/swim club
☐Soccer
☐Basketball league
☐Baseball/softball
☐Gymnastics
☐Dance/ballet/jazz/aerobic
☐Hockey/ice/roller/indoor
☐Tennis/racquetball
☐Track & field/running club
☐Football league
☐Horseback riding
☐Volleyball leagues
☐None
☐Others

Age of second oldest child
Sex of second oldest child
Check all of the structured physical activities in which your second oldest child has participated.
Age of third child
Sex of third child
Check all of the structured physical activities in which your third child has participated.
Age of fourth child
Sex of fourth child
Check all of the structured physical activities in which your fourth child has participated.
Age of fifth child
Sex of fifth child
Check all of the structured physical activities in which your fifth child has participated.

PAGE 5
Section 1: About your child's structured physical activity

Please respond to the questions on this survey as they relate to you and your child who is currently between 2 and 5 years of age. If you have more than one child in that age range, choose one child to focus on.

Structured physical activity is any physical activity your child has to be registered for that is organized and started by adults (e.g., community organizations/associations, clubs, leisure facilities).

What is your relationship to the child you have chosen to focus on?
☐ Mother ☐ Other

What is this child's age? _____

What is this child's gender? □ Female □ Male

Select all the structured physical activities that this child has participated in the PAST.

Select ALL the structured physical activities this child is registered to participate in during the next 4 weeks.

PAGE 6
Section 2: Taking your child to structured physical activity

Please choose the one activity in which your child is registered to participate in most often in the next 4 weeks. For the rest of the survey please focus your responses on this one activity.

Check the circle next to the one (1) activity you will focus on.

How much of a struggle will it be for you to take your child to this structured physical activity during the next 4 weeks?

| No struggle | | | | Moderate struggle | | | | Tremendous struggle |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Not counting this week, how many more weeks is your child scheduled to participate in this activity?
1 week left
2 weeks left
3 weeks left
4 or more weeks left

PAGE 7
In the next 4 weeks how many days each week is your child scheduled to participate in this activity?
1 day a week
2 days a week
3 days a week
4 days a week
5 days a week
6 days a week
7 days a week

PAGE 8
Beliefs

In the next 4 weeks, I am confident I can take my child to the activity even if:

Select NA (Not Applicable) if the statement does not apply to you and/or your child's situation.

My house is not clean and I am expecting guests.
Another family member (like my partner or parents) needs me to spend time with them at the same time as the activity.
I am sick.
My other child(ren) is/are sick.
Is there anything else you think will happen that might hinder or stop you from taking your child to the activity in the next month?

How confident are you that you can take your child to the activity even if what you listed were to happen?

| No confidence at all | | | | | Somewhat Confident | | | | | Completely Confident |
|---|---|---|---|---|---|---|---|---|---|---|
| 0% | 10 % | 20 % | 30 % | 40% | 50% | 60 % | 70% | 80% | 90% | 100% |

PAGE 9
In order to take my child to the activity in the next 4 weeks, I am confident I can:

Select NA (Not Applicable) if the statement does not apply to you and/or your child's situation.

Schedule my family's other commitments.
Change my personal schedule.
Plan ahead so other activities will not interfere with taking my child to the activity.
Pack the things my child needs for the activity ahead of time.
Prepare my child (get dressed, fed, etc) for the activity ahead of time.

Over the next 4 weeks, I am confident I can …

Resume taking my child to her/his activity when it is interrupted, such as when I do not take her/him for a few days.
Resume taking my child to the activity when it is interrupted such as when I do not to take her/him for several weeks or more.
View lapses in my taking my child to the activity over the next 4 weeks as challenges to overcome rather than failures.
Make a definite plan to restart taking my child to the activity right away if I should miss ***any*** sessions during the next 4 weeks.
Make up other times for my child to be physically active when I miss taking her/him to ***any*** of the scheduled activity sessions during the next 4 weeks.
Make sure I do not miss taking my child to more than one day of the activity due to other obligations during the next 4 weeks.

Page 10
Things you believe will happen

By taking your child to the activity in the next 4 weeks, how likely is it your child will:

(1 = Not at all Likely and 10 = Extremely Likely)

Build her/his self-confidence to try new activities?

Burn off energy?

Increase her/his self confidence to do an activity without her/his parents?

Become more comfortable around children her/his own age?

Make new friends?

Develop specific movement skills?

PAGE 11
How much do you value each of the following things happening as a result of you taking your child to the activity in the next 4 weeks?
(1 = Not at all Valued and 10 = Highly Valued)

Your child:

Building her/his self-confidence to try new activities?

Burning off energy?

Increasing her/his self confidence to do an activity without her/his parents?

Becoming more comfortable around children her/his own age?

Making new friends?

Developing specific movement skills?

PAGE 12
Is there anything else you think will happen because you take your child to the activity in the next month?

My child will...

How likely is this to happen?

(1 = Not at all Likely and 10 = Extremely Likely)

How much do you value this?

(1 = Not at all Valued and 10 = Highly Valued)

Thank you

Thank you for completing this survey. You may check your answers by using the "Previous Page" and "Next Page" buttons.

When you are satisfied with your results, return to this screen and select the "Finish" button. Your survey will be saved.

**Survey 2 of Study 2**

PAGE 1

Structured physical activity is any physical activity your child has to be registered for that is organized and started by adults (e.g., community organizations/associations, clubs, leisure facilities, etc.).

PAGE 2

We would like you to think about the same structured activity that you chose to focus on in the 1st survey. This activity was the one that your child was registered to participate in most often.

Check the one (1) activity that you will focus on.

☐ Swim lessons/swim club
☐ Youth soccer
☐ Basketball league/camp
☐ T-ball/baseball/softball
☐ Gymnastics/tumbling
☐ Dance/ballet/jazz/aerobic
☐ Hockey/ice skating/roller skating/indoor
☐ Tennis/racquetball
☐ Track & field/running
☐ Football league/camp
☐ Horseback riding
☐ Volleyball leagues/camp
☐ Others

**Think about this 1 activity when answering the rest of this survey.**

How long (in minutes) does it usually take you to drive your child to the activity (one-way)?

_____

Think about the last 4 weeks. Which weeks did YOU actually take your child to the activity? This question is only about YOU taking your child, not anyone else. Select all that apply.

☐ Last week
☐ 2 weeks ago
☐ 3 weeks ago
☐ 4 weeks ago

On how many days last week did YOU actually take your child to the activity?

On how many days 2 weeks ago did YOU actually take your child to the activity?

On how many days 3 weeks ago did YOU actually take your child to the activity?

On how many days 4 weeks ago did YOU actually take your child to the activity?

Thank you

Thank you for completing this survey. You may check your answers by using the "Previous Page" and "Next Page" buttons.

When you are satisfied with your results, return to this screen and select the "Finish" button. Your survey will be saved, and you will be sent to the U of S Survey Tool web site.

Appendix J. Study 1: SPSS Alpha if Item Deleted Output

**Item-Total Statistics**

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|---|
| OE_likelihood_1 | 62.60 | 49.372 | .595 | .590 | .840 |
| OE_likelihood_2* | 63.76 | 41.346 | .530 | .378 | .848 |
| OE_likelihood_3 | 62.78 | 47.724 | .650 | .457 | .833 |
| OE_likelihood_4 | 62.84 | 46.039 | .758 | .719 | .823 |
| OE_likelihood_5 | 63.05 | 43.207 | .652 | .710 | .826 |
| OE_likelihood_6 | 63.83 | 35.727 | .693 | .658 | .829 |
| OE_likelihood_7 | 62.95 | 45.498 | .665 | .500 | .827 |
| OE_likelihood_8* | 63.30 | 45.666 | .521 | .481 | .841 |

*Note.* *item was deleted.

**Item-Total Statistics**

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|---|
| OE_value_1 | 63.03 | 60.824 | .677 | .604 | .842 |
| OE_value_2* | 64.05 | 50.236 | .618 | .459 | .836 |
| OE_value_3 | 63.55 | 57.617 | .520 | .367 | .846 |
| OE_value_4 | 63.38 | 55.000 | .758 | .796 | .824 |
| OE_value_5 | 63.67 | 51.399 | .625 | .705 | .834 |
| OE_value_6 | 64.25 | 47.683 | .579 | .450 | .850 |
| OE_value_7 | 63.80 | 55.022 | .611 | .491 | .836 |
| OE_value_8* | 63.31 | 55.806 | .691 | .675 | .830 |

Note. * item was deleted.